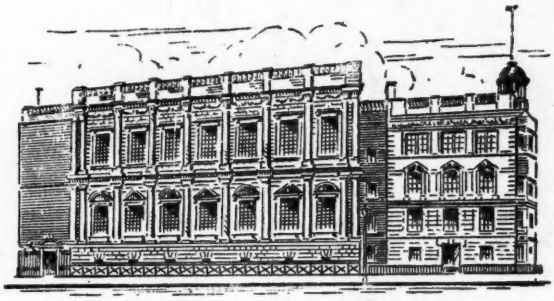
Vol. LXXIII. AUGUST, 1928 No. 491

JOURNAL



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Vol. LXXIII. AUGUST, 1928. No. 491.

ROYAL UNITED SERVICE INSTITUTION

FOR

"THE PROMOTION AND ADVANCEMENT OF NAVAL AND MILITARY SCIENCE AND LITERATURE." *Royal Charter, 22nd February,* 1860 (23 *Vict.*).

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The Royal United Service Institution is situated just below the War Office in Whitehall. It has the best professional Library in the United Kingdom; a Lecture Theatre where an autumn and winter session of lectures is devoted to subjects of current or historical Service interest. The Reading and Smoking Rooms are provided with the leading papers, periodicals and writing materials.

The Institution is open daily from 10 a.m. to 7 p.m., except Sunday, Christmas Day and Good Friday.

THE JOURNAL.

The R.U.S.I. JOURNAL is published quarterly and sent post free to Members in any part of the world.

THE MUSEUM.

Situated in the Banqueting Hall of the old Palace of Whitehall (1622), with its magnificent Rubens ceiling, the R.U.S.I. Museum is a treasure house of relics and mementoes of great victories and renowned warriors. There is also a most valuable collection of Uniforms, Medals, Ship Models, and models of the battles of Trafalgar and Waterloo.

For Members and their friends, there are private entrances to the Museum from the Institution.

Sailors, Soldiers and Airmen in uniform are admitted free at the public entrance.

Admission to the general public is 1s.; Saturday afternoon, 6d.

SECRETARY'S NOTES

August, 1928.

INSTITUTION.

Council.

Captain W. M. James, C.B., R.N., and Lieutenant-Colonel A. F. A. N. Thorne, C.M.G., D.S.O., respectively, have been appointed Members of the Council, on Admiral Sir R. G. O. Tupper, G.B.E., K.C.B., C.V.O., and General Lord Horne, G.C.B., K.C.M.G., D.C.L., LL.D., becoming Vice-Presidents.

Major-General P. G. Grant, C.B., C.M.G., has been elected a Member of the Council in the vacancy caused by the resignation of General Sir Philip W. Chetwode, Bart., K.C.B., K.C.M.G., D.S.O., A.D.C., on his taking up an appointment in India.

New Members.

The following Officers joined the Institution during the months of May, June and July :—

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Rear-Admiral A. D. P. R. Pound, C.B., R.N.
Lieutenant C. O. H. de Lacy-Bacon, R.N.
Commander H. M. Daniel, D.S.O., R.N.
Lieutenant R. W. Griffith, R.N.
Paymaster-Lieutenant F. J. Carey, R.N.R.

ARMY.

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Lieutenant B. L. de Robeck, M.C., R.H.A.
Captain E. W. Sheppard, O.B.E., M.C., Royal Tank Corps.
Captain R. K. Henson, M.C., 3rd/11th Sikh Regiment (Rattray's Sikhs).

Captain V. Dykes, Royal Engineers.
Major W. E. de B. Whittaker, King's Regiment (R. of O.).
Captain V. H. Wells-Cole, M.C., King's Own Yorkshire Light Infantry.
Captain J. A. C. Tengely, British Guiana Militia (retired).
Lieutenant J. Lennox Jamieson, 2nd Bn. Royal Scots.
Brevet Lieutenant-Colonel Henry Archer, D.S.O., R.A.
Lieutenant Gregory Cashon, R.E. (R. of O.).
Captain Dudley Russell, M.C., 13th Frontier Force Rifles.
Captain M. P. Lancaster, 5th Mahratta L.I.
Major Hon. E. H. Wyndham, M.C., Life Guards.
Lieutenant A. O. W. Buchanan, Worcestershire Regiment.
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Captain P. J. M. Ellison, Grenadier Guards.
Captain O. W. D. Smith, Grenadier Guards.
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Pilot Officer E. C. T. Edwards, R.A.F.

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It is requested that all Cheques, Money Orders, etc., be made payable to " The Secretary, R.U.S.I." and crossed " Drummond's Branch—Royal Bank of Scotland, a/c R.U.S.I."

Annual Subscriptions.

Members, who do not already do so, are specially requested to pay their annual subscriptions by Bankers' Order. Forms can be supplied on application.

JOURNAL.

Notes for Guidance of Contributors.

The Editor has been asked to publish some notes for the guidance of those who desire to offer contributions to the JOURNAL. The following are the principal points to which attention is invited :—

(1) Preference will be given to articles which assist in the " promotion and advancement of naval and military science and literature " in practical form and which are written with an up-to-date and first-hand knowledge of the subject with which they deal.

(2) Historical articles should point some definite lesson for the present or future and not merely recapitulate accounts of episodes of the past.

(3) Articles of interest to students of war in all three Services are preferable to those of a highly technical nature or of such restricted interest that they could only appeal to a very limited number of our readers.

(4) As a general rule articles should not exceed 3,000 words in length. Apart from considerations of space, experience shows that the short article which makes its points concisely is more effective and more widely read than one of a long and rambling character.

(5) Contributions intended for the JOURNAL should be addressed to the Editor. They should, if possible, be typed (double spacing), but short articles in legible manuscript can be accepted if a typewriter is not available.

(6) The Editor is authorized to obtain official sanction for the publication of articles written by serving officers; it must be clearly understood that nothing written by such officers can be accepted for the JOURNAL without this sanction being obtained.

(7) Except where contributors are good enough to offer articles without remuneration, this will be paid at the authorized rates.

(8) Attention is invited to the note on the first page of each JOURNAL regarding authors alone being responsible for their opinions: also to the notice at the head of " Correspondence."

Navy and Air Articles.

Numerous articles continue to be received from military sources, but the Editor would welcome more contributions on naval and air subjects.

MUSEUM.

Policy.

The Council has approved of a policy, whereby the exhibits in the Crypt of the Museum shall gradually be modernized with a view to their representing the latest developments of the three fighting Services. It is particularly desired to inaugurate permanent collections of models illustrating :—

1. The latest types of British warships.
2. The mechanization of the Army.
3. The latest types of war aircraft.

It is also desired to bring the collection of gun models up-to-date.

Members are invited to co-operate in any way they can to promote this policy.

It is not the intention to change in any way the character of the exhibits in the main Banqueting Hall.

Special Exhibitions.

The two Special Exhibitions, illustrating "The Navy of To-day" and "The Army of Yesterday and To-day" are being continued throughout the ensuing Quarter.

Navy League Lectures.

Arrangements have been made with the Navy League to give a series of six lectures, to which the public, visiting the Museum, will be admitted free. Members of the Institution are, of course, always welcome.

The Programme of Lectures is as follows :—

1.	"The Attack on Zeebrugge and Ostend," by Captain G. R. L. Edwards, C.B.E., R.N.	3.30 p.m., Saturday, 6th October.
2.	"Life in the Modern Navy," by Commander H. Taprell Dorling, D.S.O., R.N.	3.30 p.m., Saturday, 13th October.
3.	"Work of the Grand Fleet in the War," by by Captain E. L. Frewen, R.N.	3.30 p.m., Saturday, 20th October.
4.	"Coronel and the Falklands," by Lieutenant-Commander John J. C. Irving, R.N.	3.30 p.m., Saturday, 3rd November.
5.	"Modern Ships of the Royal Navy," by Commander The Hon. S. M. A. J. Hay, O.B.E., R.N.	3.30 p.m., Saturday, 10th November.
6.	"Destroyers in the Great War," by Commander H. M. Denny, D.S.O., R.N.	3.30 p.m., Saturday, 24th November.

Coloured Engraving of H.M. Yacht "Royal George."

A fine engraving of H.M. Yacht "Royal George" has been purchased out of the Museum Purchase Fund and is now hung in the public entrance to the Museum, together with the original figurehead and stern scroll work of the ship, which have been moved to this position.

Additions.

(7966) A carved Ivory Card Case, representing, on one side, Napoleon's residence "Longwood House," at St. Helena, and, on the other, his tomb.—Given by H.M. The Queen.

(7967) A Seal of Major Henry Foster, commanding the Kamaniyar Brigade, Shekhawati, 1841.—Given by A. E. Capadose, Esq.

(7968) Viscount Wolseley's Banner of the Order of the Bath.—Given by Frances Garnet, Viscountess Wolseley, daughter of the late Field-Marshal.

(7969) A Wind Vane from the Turkish Fort at Sadd-el-Bahr, Cape Helles, picked up in December, 1915.—Given by Brigadier-General A. E. J. Cavendish, C.M.G.

(7970) A French Artillery Sword with patent spring hilt for providing protection. Period about 1820.—Given by H. H. Harrod, Esq.

(7971) Office Seal of the Transvaal Public Prosecutor.—Given by Major-General Sir F. Smith, K.C.M.G., C.B.

(7972) A Military Cheque, issued during the Siege of Uppington, South African War, 1902.—Given by Major-General Sir F. Smith, K.C.M.G., C.B.

(7973) Helmet Plate of the South African Republic Police.—Given by Major-General Sir F. Smith, K.C.M.G., C.B.

(7974) An Aquatint in colours, of H.M. Yacht "Royal George," by E. Duncan after W. J. Huggins.—Purchased.

(7975) Black Marble and Silver Cup from the Palace of Tippoo Sultan, captured by the 20th Madras Native Infantry at the storming of Seringapatam, 1799.—Given by the Officers of the 1st Bn. 3rd Madras Regiment.

(7976) A Plate recovered from a seamen's mess when salving the German Battle Cruiser "Moltke."—Given by Hon. Surgeon-Commander J. D. Pollock, O.B.E., M.D., R.N.V.R.

(7977) A Napoleonic Inkstand and Penholder.—Given by H.M. The Queen.

Attendance.

The amount taken for admission during the past quarter was :—

£152 os. 6d. in May.

£148 1s. 0d. in June.

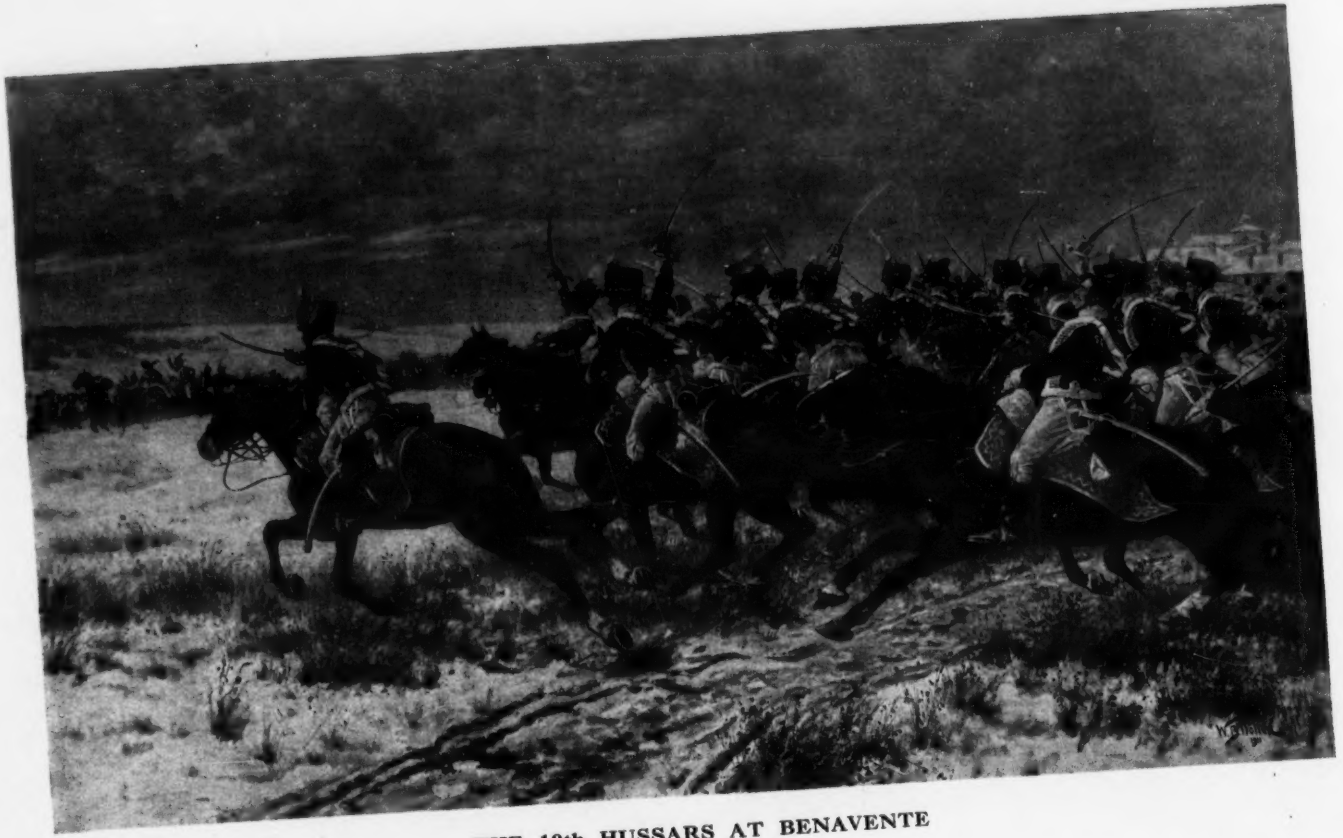
£154 6s. 6d. in July.

Purchase Fund.

This Fund was opened with the object of purchasing suitable exhibits, which from time to time are offered to the Museum, or are put up for sale at various auctions. The Council hope it will receive support from Members of the Institution who are interested in the Museum.

	£	s.	d.
Amount already acknowledged	37	16	8
Captain H. Bullock, I.A.	0	5	0
"C.A.B.P."	1	1	0
	39	2	8
Coloured Engraving of H.M. Yacht "Royal George" purchased for	15	10	0
Balance in hand	£23	12	8

Contributions to this Fund may, if the donor wishes, be earmarked for the new collection of models which it is desired to install in the crypt.



By courtesy of the Artist

THE 10th HUSSARS AT BENAVENTE
CORUNNA 1809

From the painting by W. B. Wollen, R.I.

THE JOURNAL
OF THE
Royal United Service Institution

Vol. LXXIII. AUGUST, 1928. No. 491.

THE MODERN STAFF OFFICER

By MAJOR-GENERAL SIR W. E. IRONSIDE, K.C.B., C.M.G., D.S.O., General Officer Commanding 2nd Division, Aldershot.

On Wednesday, 18th January, 1928, at 3 p.m.

ADMIRAL-OF-THE-FLEET SIR CHARLES MADDEN, Bart., G.C.B., G.C.V.O., K.C.M.G., LL.D., First Sea Lord, in the Chair.

THE CHAIRMAN introduced the Lecturer, adding that Sir Edmund Ironside was very well known to all, even to naval officers, because during the war he commanded both Services, and had since then filled the post of Commandant of the Staff College at Camberley. He further expressed his gratification that so many naval officers should have come to hear the lecture.

LECTURE.

I.—THE STAFF OFFICER IN THE PAST.

THERE is no necessity to prove that a Staff is needed for an Army. No machine will work unless there are people to drive it. This fact, however, has not always been understood. If we study the history of the Army we see that there has been very strong opposition to special training for the Staff, due to one or two important factors. The first factor seems to have been the regimental system which existed and still exists in the Army; the second, that war had come to be looked upon rather as sport than business. As a result, foreign officers were used on the Staff.

The training of the British Staff Officer began in 1799. Major Godwin Austen's charming book on the Staff College clearly shows the difficulties that had to be overcome. When General Le Marchant first began to devise a system for teaching Staff Officers he had to start with a French head teacher. Then, when that Frenchman, Jarry, had finished his time, application was actually made for a Prussian, Scharnhorst, to come and take his place. These difficulties were really great, for we find in a letter from Le Marchant, who was pushing the education of the Army as fast as he could, the statement that the formation of a Staff College (the Royal Military College as it was called), was "a step towards withdrawing the officer from civil society and making him a creature of the Crown." That was in 1799. Not long after that, in 1801, the Adjutant-General, who then dealt with detailed matters of discipline, said: "Seeing that officer students by being there [at the R.M.C.] were avoiding service with their regiments, there is an impropriety in even soliciting leave." As late as 1832 the Commander-in-Chief wrote: "The Commander-in-Chief looks on time spent at the Senior Department, R.M.C., as so much leave of absence under most favoured conditions." Even after the Boer War, in 1902, I can remember certain first class regiments in the Service taking a pride in not sending officers to the Staff College, their view being: "We are regimental officers; we have a wonderful regiment and we do not send officers to the Staff College."

The cult of the "practical soldier" was at its height about that period, and he was held up to be a man who did not avoid service with his regiment. Many of us know the amount of work that was done in our regiments before the Boer War and after it! The life of a soldier in those days was a very happy one, for war really was more sport than business. I myself remember, when I was a horse artilleryman in 1907, lying in hospital, that my colonel came to see me and saw two military books on my table. He said to me: "What the devil are you reading those for? You are a horse artilleryman; what more do you want?" That was in 1907, only seven years before the Great War began! Many of you may have had a similar experience. Perhaps some of you were discouraged from going up for the Staff College, as I was.

The idea then prevailed that staff work was too much routine, all paper work and dull. Many officers did not want to do it, not because it was beneath the dignity of a British officer, but because it was regarded as not being in his line, since he was a fighting man. Many men said to themselves: "All right; when the moment comes inspiration will come upon me and I will do the right thing, because Nature has made me a fighting man." Nevertheless in some ways he was right, for nobody at that time understood that there were two kinds of Staff, the Staff in the field and the Staff not in the field.

Let me now speak of the two kinds of staff work. The work of the Staff in the field is the more simple. In the days of the Peninsular War and of Waterloo staff officers consisted of two kinds, gallopers and commissaries. The galloper was very often a relation or a friend of the General selected on the principle: "Take an officer who is not too full of brains because he will not interfere with you, and he will only do what he is told." So he would merely be given a quick order, galloped off and delivered his message. The work of the commissaries consisted solely in bringing up supplies. People did not move quite so quickly in those days and the commissary was in fact not a fighting man.

Now the most important part of staff work resides in the study of war during peace and preparation for it, so as not be be surprised when a war arrives. This is essential, since the soldier's trade cannot be practised with reality in times of peace. There is always the absence of the bullet and the absence of fear. When bullets are flying about and people are afraid they do not behave in the same way as they do when they are not afraid.

There used to be no study of war in peace time; there was no body of men who existed to think: "What is the best thing for war now as it stands, and for the next war that may come?" When war broke out people were collected together in a hurry, friends and relations of the General, who looked upon it as sport and wished to get some good fun. There was no unified training; there was no idea of collecting ideas on training; or as to how the next war would be fought. There was no unified drill book. Some distinguished officer would come back from a war and issue a drill book, if he had the energy to do so, and that drill book would be used for ten or twelve years and then disappear with the author. So there was no continuity and that side of staff work never existed. No administration existed; as a matter of fact administration was looked down upon, being even more routine than staff work in the field. There was thus little question of staff foresight. Yet without foresight you cannot have continuity; consequently you must have men studying steadily and slowly during peace.

The Crimean War gave us our first awakening. Our second awakening came with the South African War. Both these events came as a godsend to the British Army. They showed us our failings; they unified the Staff; in short, they produced the possibility of our creating a fine Army. Those awakenings were simply due to the fact that there had been no study of war in peace. Yet in this Empire of ours there exists a very special reason, far more than there is in France or Germany, for studying war in peace. In France soldiers are faced with but a single

problem, while Germany has perhaps two at the most such problems. We have several. We never know where we may have to fight. Think of all the places we may have to go to, or of the places that we have been in — Egypt, China, South Africa. Will it be in the centre of Asia next? We do not know. But if we do not study these things we shall make mistakes. Remember the old story of the wire which came from South Africa, that, at the moment, they wanted no mounted troops; they wanted dismounted men. Perhaps it was an accidental administrative mistake, yet the story holds good. Had we made a real study of South African problems and of the forces that would be required out there, I am confident that things would have happened differently. In the future we may know better. Nevertheless, remember that we are not the only people who have made mistakes. There is the French campaign in Madagascar, where they sent out to a country with no roads two-wheeled vehicles as the main transport of the French Army, with the result that men died like flies while roads were being built for those carts. Had pack transport been sent out the story would have been different.

II.—The Nature of Staff Work.

There are two classes of staff duties. The first is with troops, and the second is at the War Office; this is the initial division of staff duties, which holds good in peace and in war. It is very important that there should be an interchange between the two duties. If a man always serves with troops he becomes like the countryman, who says of the townspeople: "Curse these people, what do they do for a living? They supply us with nothing." They forget all questions of collection and distribution; so it is with those who are always with troops. They are continually cursing the War Office; they do not know what goes on at the War Office, and there is always trouble. Each class must understand the other's difficulties.

We must always remember that the Staff exists for the welfare of the troops; that is sometimes forgotten. One is apt to deal with paper only and to forget the figures that are going to dance at the other end of the string when it is pulled. So there must be such an interchange between the two forms of staff duty as will prevent men being kept too long at either. We all want to serve with troops. With troops there is no doubt that the work is more showy; it is certainly much more simple; it is more human; it is easier to do; it is a much nicer kind of work. It may be harder physically, but it is certainly less hard mentally. One also meets General Officers who may be commanding in a future war. That may mean a good appointment! We know a man will choose as assistants the officers whom he knows, because he thinks they will do better than those he does not know.

On the other hand, at the War Office the work is more mental and less physical. There our officers unquestionably suffer from lack of exercise, and they require much more exercise than a foreigner, who seems able to go on day after day without it. Also at the War Office there is more routine and work is much less noticed. Still, let me give you an example of staff work which I know to have been priceless. I remember that at the beginning of the war, being then a student at the Staff College, it fell to my lot to go to Boulogne to disembark the troops. I was Staff Officer for the Base. When I mobilized and went to Southampton an officer from the War Office came down to give me my last orders. He was one of the Staff who had worked out the train time-tables which were so wonderfully effective in getting the Expeditionary Forces across to France, a task, by the way, hardly mentioned in our Official History of the War which does not even state where the Army landed. That man came down and handed over to me the clearest papers I have ever received. He said to me: "Go nap on the troops actually coming to the port of Boulogne! When the French come to you and say 'Will you have these troops here? Have you got them?' go nap! Even though you have not then got the troops, they will be there to the hour." As he said that he leant back in his chair and went to sleep. I picked him up and put him on my bed and left him there. That man had, for weeks—almost for years—done the unnoticed work, all that calculation, carried out interviews, and done it all in secrecy. Yet he was left behind when the Expeditionary Force went over to France. He had none of the excitement of active service to look forward to.

This brings me to the problem of specialization. In the Army we try not to specialize in the youthful ranks, though it is idle to say that one man is not more fitted for a particular job than another. Later on in life men can specialize. What we want is a sound basis, so a young Staff Officer must have a turn at everything. It is far better to begin specializing later on in life.

May I quote the instance of a very distinguished officer, who said to me: "Of course, men are different. I was a Chief Staff Officer to two famous Generals, and this was the difference between them. One would come down in the morning on his horse, ride round and view things and afterwards say 'so-and-so.' I understood everything he said. Then he would go home in the evening and write a note about things and elaborate them so much that I was in hopeless confusion. The other rode round and said 'so-and-so,' and I could understand nothing of what he meant. Then he would go home in the evening and write me a paper, and I understood every word he wrote." People are different. One man is more suited to be out among the bullets and to work under

those conditions, while another man is much more suited to the quiet and peace of a dugout. That difference must be borne in mind.

Now let me once more divide the work into what I will call the General Staff and the Administrative Staff. More and more we are recognizing that war is administration, because armies have swollen to a very big size. Sometimes the theatres of war in which we try to use them cannot support them: an army may even be too vast or move too quickly to be administered in an area. If you take our last advance in 1918, I think no one will deny that administration stopped it. It certainly stopped the French. They reached a point in the devastated country where they could not further supply their armies. The troops could have gone on, but they could not have been fed, and they would have crumbled away like the Russian armies did. You can find example after example in the Russian advances of how they pushed forward impetuously not thinking about the administration at all, until they reached a point where they could not be fed. The German Army in 1914 had very nearly reached that point, but their organization on the rear lines was so good that they did not actually crumble, although after the Marne they very nearly went to pieces. They were saved by their administration, which came up so fast that it just caught up the troops—but no more—when the advanced units had actually outmarched their food and munitions.

In view of the mechanization now taking place, war is still more becoming a matter of administration. Brilliant, unsound plans are of no value. It is no use saying: "I am a general; I have made a plan. It must be a good plan because I have made it myself." The plan must be based on a sound administration. If you have not had any administrative training your plan may be very brilliant strategically, yet unsound. But specialization must come, for we cannot say that every officer is fit for every job. He is not. Certain men are much more suited to deal with things in peace and quiet than they are in the turmoil of the actual field of battle. I know many officers who get better as things get worse in action. The greater the confusion, the clearer their brains become. A crisis is a stimulant to them.

Let us turn now to the ramifications of administration, and in regard to that let me cite the single instance of the controversy that went on between the Westerners and the Easterners in the late war. People said: "Here we are up against a wall; we cannot get through; let us go round the wall; let us transfer the whole force of the British Army to Salonika." Look at all the ramifications thereby implied. It was easy enough to transfer the troops, but look at what it meant. First of all the Navy was at once brought into the problem; it was

asked to send forces—or at any rate a certain number of ships—down into the Mediterranean from the North Sea. These were at once assailed by submarines so that it was necessary to double and treble the anti-submarine services. Think of all the ramifications of that brilliant idea of sending people round the wall; and yet in the end the easy train journey from West to East was always available to the Central Powers.

I will give you another illustration of faulty administration, a very small one it is true. When in North Russia, where in the winter it was very cold, the authorities wrote to me: "We are sending you the best battalion we have." I might mention that it was almost worse than C3, 60 or 70 per cent. of the men being short-sighted. As soon as the battalion arrived the men were frost-bitten because of their steel-rimmed glasses. Those steel-rimmed glasses had to be fitted with pieces of wood, or have the frames wound round with yarn, a considerable undertaking.

III.—The Staff College and its Training.

I think we may state that the Staff College was resuscitated in 1902, and the three men who resuscitated it were Lord Rawlinson, Sir Henry Wilson and Sir William Robertson. The year 1902 was the heyday of the Staff College. Lord Rawlinson took charge at the age of thirty-nine. Very few people realize that he was so young when he assumed his duties. But there never has been a better example of a youthful man undertaking onerous duties with outstanding success.

What is the work and what is the object of the Staff College? If you look at the Regulations you will find that the Staff College exists for giving an officer, firstly, training in the higher art of war, and secondly, in the duties of the Staff—in that order. So our Staff College is not really a Staff College but a War College. We now have a very good course indeed at the College, in which officers are taught to be higher Staff Officers and also Commanders. I think one must never forget that this is rather different from Staff Colleges which exist on the Continent. We train men to be commanders. But we have to remember the limitation of our output. Now, new armies cannot be made without a proper Staff. That was our great difficulty in the last war—the making of a Staff. We have to remember that our Staff Officers as they exist on paper to-day—say they are graded as G.S.O.3—must, on mobilization, go up one or two steps almost at once, or at any rate very quickly. Then they must train others.

When Commandant at Camberley what struck me very much was the stiffness of the entrance examination. Something like 600 officers came up, yet, I think, there were only thirty-two places open for competition; the rest were nominations. Many officers used to come to

the Staff College worn out; I myself tried four times before I got in, and I know many officers who have gone up three times and have worked for years to get in.

A curious point arises out of the question of nomination. One is very apt to say: "Look at so-and-so, he got in by examination. Look at so-and-so, a very fine fellow; he ought to have got in!" My experience, after carefully going through the statistics of officers who were nominated and who passed in, is that the nominations by no means produced the best Staff Officers. That means that we are very human indeed in our nominations! Amongst the nominated officers who came under me were always some of outstanding brilliance it is true, yet at the top and in the middle of the list one would find the men who passed in highest at the examinations. Nominations alone cannot enlarge the College all at once; an examination must enter into it also. I quite agree that many men who pass in can work best quietly on paper, but again there are many jobs that require to be done in quietness and with deliberation. You must put officers into those positions who are fitted for them. There is a place for every one, but at present our numbers are very small for all that we require. Without alluding to policy or money—which have nothing to do with me—I am merely stating what I observed at the Staff College.

The Staff College used to be called a forcing house for unpleasant people, but that is not so now. I can assure you that the men who come out of it are most pleasant individuals. They amuse themselves just like the regimental British officer does, the reason being that they are good regimental officers to begin with. The task of the Army is thus to produce the best regimental officers, then to hand them to us so that we may train them for the Staff. Even now there is still an idea abroad that officers should go the the Staff College to get the *p.s.c.* and that is all. It is not so. They go there to be trained. I can assure you from personal experience that the training of the students at Camberley is thorough and no light task. The fact is that officers at the Staff College receive very high-class training, and not only are they trained there but they are also tested.

IV.—The Staff Officer and the Army.

We have to keep a continual effort going on to prevent the formation of a special breed of Staff Officer. After the war, if you remember, there was much talk on this subject. It was said: "Why should the Staff Officer be a different being from the fighting man who went through all the worry and the danger. A special breed of Staff Officer is not wanted." Now let me state once and for all that he does not form such a breed. He is the best of the regimental officers that we can get and he

is trained to the highest point. He works five times as hard mentally, and probably as hard physically, as most people. This attitude of mind recalls the old idea that manual labour is the only honest thing or good thing in the world: just as the Bolshevists suggest. That is not so really. Men who use their brains to direct others are essential. One cannot possibly endorse the idea that manual labour is the only thing that matters, or that the only man who suffers is the man in the actual trenches and the man who fights. I think, moreover, that in some future war the most trying experiences may come to those outside the Army, far back from the fighting front.

At the Staff College a continual effort is made to turn out the officer who has the welfare of the troops at heart, no more nor less. In order to become that, the Staff Officer, moreover, must not remain on the Staff for the whole of his service; he must go back to troops. The Staff Officer and the Commanding Officer are complementary and they must understand each other. The Staff Officer must have commanded in his career, while the other should know something of the difficulties of the Staff.

Here, again, one finds that on reaching the higher ranks, a man may be more suitable for staff or for command. But in the lower ranks the officer should be tried in both capacities, so that he may show whether he is good for command or for actual staff work. Specialization then comes later in his career.

V—The Characteristics of the Staff Officer.

Now, what are the attributes that we look for in a Staff Officer? I think the first that I would like to name would be the *assumption of responsibility*. The basis upon which our Army is built up is that the commander may be able to go away and yet no change takes place; that is to say, the command will continue and orders still be given out as before. We are not like the Senior Service which, so to speak, lives close together. Our commands are spread out, and there are times when a commander has to be away. He has to go back to headquarters, or he has to go and look at things for himself either up a mountain or from an aeroplane. He has to go on moving about, and the command must continue. Therefore, the Staff must be able to assume responsibility. They must be able to act just as if the commander were there. That is the basis of command in our Army, namely, that the Staff will go on working whether the commander is absent or killed—in other words, whatever happens. There must be continuity.

The next point is *improvisation*. I cannot imagine anything more important than that for a British Staff Officer. He never knows what

he is going to be called upon to do. He may be told to land a force at some particular port, where he may have to improvise everything. He has to make up his mind how much of the transport can be brought, how much native transport can be organized on arrival; how soon the stores will arrive. So it goes on. The lot of the Staff Officer is very peculiar in regard to this matter of improvisation.

Another point I want to emphasize is that the commander of an army, or of any formation, is very isolated. That, I think, has been driven home to me more than anything else in my service. He does not see everything. Often and often a Staff Officer comes to say: "Do not you know that, Sir?" And the General can only reply: "No, I had not the slightest idea of it." To which the Staff Officer answers, "I thought everybody knew that, Sir." One does not see everything; one cannot; therefore the Staff must be the eyes of the General. They must come and tell him what is going on; there is no question of spying or anything underhand at all. It is simply done to keep the General informed and in touch with everything; however much he may go round and talk, he will, and must, miss things. The Staff must not be regarded, as they go round, as though they are spying. Between the Staff and the commanders there must be infinite tact. The Staff must go about and see, then report to the General exactly what is happening. I will give you an instance of what I mean. A Staff Officer once told me that he had to work under two Generals who were different in every way. That is one of the greatest difficulties of the Staff Officer, to try and keep in touch with different characters; one General will allow the Staff Officer to do a great deal; the other permits him to do nothing at all. Well, this Staff Officer told me that he had received a letter in which it was said with great bluntness that certain things were not going on well. He went to the General, who said: "I will put that all right." About a week later he mentioned the matter casually to the people concerned and quietly put the matter right. The same point happened with the second General, who simply said: "I shall put you under arrest; I will not have any spying going on about me." There is a middle way of doing things properly. It is very important indeed that there should exist sympathy between the General and his Staff, and between the General and the Commanders of the troops.

VI.—The Appointment of Staff Officers.

The appointment of Staff Officers has always presented a difficulty Should the General be allowed to appoint his own Staff, ask for certain men; and should he be allowed to say "I would like so-and-so, if I could get him." What is to be avoided are "gangs," a General with "a long tail," or the statement that so-and-so is "so-and-so's man." Still you

must allow that a General will select men whom he knows more or less. When all is said and done I think the system that we now have is absolutely the best. As a commander, one does not know who will be selected for a Staff Officer. The choice rests with people who know; they select, and the nominees arrive. I will not say there are no "gangs" nowadays, because gangs get together somehow, but there are very few of them. The selectors must know that X is animated with one set of ideas, while Y is the reverse; so they ask themselves: "Will they fit?" They have something to guide them in their selection. At times they may make mistakes, but they do avoid gangs, and that is very important.

VII.—Conclusion.

I will make just one last point about the German General Staff. The German General Staff was a very highly trained body of men. The temperament of the German is such that he is a routinist. He is a hardworking organizer—given time. The German, in 1914, had brought together a wonderful instrument which worked in peace most extraordinarily well. It went into all the ramifications of mobilization and intelligence, all that hidden work which is so difficult. Now it has gone. I think that the dissipation of the German Staff has destroyed German military power more than anything that I can think of.

I think you will better understand my point from what I have first told you of our own difficulties in making an Army.

I have tried to give you a short idea of the difficulties we have experienced and what we want. I really do think, after seeing and knowing four yearly courses of officers going through the Staff College, that they are very high-class men. The competition to get in is enormous. They are highly trained while studying there. I think they return to the Army as a very fine body of regimental officers who have been highly trained in the art of war.

I am sorry that we cannot train a very much larger number. In the future if we can somehow get more money we ought to be able to train a very much larger number of officers.

DISCUSSION.

Major-General Sir George Aston emphasized the need for loyalty as one of the most important attributes of a good Staff Officer. He agreed with the lecturer's remark that the Staff Officer should be a responsible officer, but he ought not to show it.

He attributed the beginning of co-operation between the Navy and the Army chiefly to Lord Rawlinson. When the Naval Staff was first started, the speaker remarked, the difficulties were not so much in getting the Staff trained, but there was a general and perfectly justifiable idea in the Navy that staff work was not wanted in the same way that it was required in the Army. The lecturer pointed

that fact out when mentioning that in the Army much more responsibility must be taken by the Staff Officer.

In the Navy there is always a Commander-in-Chief of the fleet to be referred to and to take chief responsibility. That is one of the main differences. Another difference is in the administrative work for the Navy, where much detail affecting movement is done on shore away from the fleet itself. He suggested that the Navy should not copy the Army too blindly, but only provide for the actual work that is to be done.

LIEUTENANT.-COLONEL R. T. HOLLAND, R.A.: The lecturer has referred at length to the Staff College, and as there are many officers of the sister Services here to-day, I should like to remind him that we have within the Army two sister Staff Colleges—Camberley and Quetta. The training at both is equally Imperial. Quetta lacks one thing to make its training entirely Imperial; there are no officers of the Royal Navy there as at Camberley.

THE CHAIRMAN: You must remember that there is the Royal Indian Marine, and I expect some of the Royal Indian Marine officers will drift up to Quetta.

COMMANDER D. C. LANG, R.N.: It would appear that this lecture on the subject of Staff Officers comes, from the naval point of view, at a very opportune moment. One reads in the papers now nearly every day that the Naval Staff at the Admiralty is far too large. That is a favourite topic in *The Daily Mail* and other papers of that kind. Of course, I do not know what the official reply on the part of the Admiralty may be to this attack, but it occurs to me that our lecturer has provided a very good answer. General Ironside has told us that the Boer War came as a very severe shock and awakening to the British Army and from that shock and awakening was evolved that magnificent small Expeditionary Force that faced the Germans in 1914. Not only did it provide that force, but it provided the nucleus out of which grew that other equally magnificent force of five million men which faced our many enemies in every theatre of the war.

Unfortunately—if I may say so with great deference to my senior officers—the Navy had felt no such shock and no such awakening. (The Chairman: I am not so sure). It went into the Great War after about a hundred years of more or less constant peace and it had never experienced any really great reverse. The result was that, possibly, we went into the war thinking we knew all that there was to be known about naval warfare. We had not trained up any naval Staff Officers, and the Navy as a whole had not studied war in all the details it might have done.

Now we have had our awakening and we find it is necessary to employ a much greater staff at the Admiralty and to produce a great many more Staff Officers to study war in far greater detail than we did before the last big war started. That seems to me to provide a very good answer to *The Daily Mail*.

COLONEL R. E. DAUBENY expressed the view that the Staff Officer should not think about what has happened so much as about what is going to occur in the future.

MR. A. C. CAMERON: I should like to raise the question of the desirability of increasing the sympathy between the Staff Officer and the regimental officer. We want, if we can, to overcome the difficulty of the hard things that the regimental officer always says about the Staff Officer. The regimental officer only sees the Staff Officer occasionally and does not realize anything that goes on which he does not see. The Staff Officer then has the disagreeable task of criticizing what the regimental officer is doing. This lack of sympathy is a most important point.

MAJOR-GENERAL SIR W. EDMUND IRONSIDE, in reply: There are only two points that have been raised in the course of the discussion which require a reply. Colonel Holland mentioned the question of the Quetta Staff College. We always used to regard it as " the Staff College " ; the two colleges are so closely connected that one does not like to say they are different, and that is why I spoke of " the Staff College." That is the reason I never mentioned Quetta ; it is not a question of leaving it out. The other point raised was with regard to the question of sympathy. I can only say that sympathy must also come from the regimental officer. I have met officers who really had no sympathy for the Staff ; they must learn to have it and show it. If good regimental officers go to the Staff College and become Staff Officers, they are not turned into impossible men simply by going there and being trained there. The Army must know it. In the Territorial Army I find that the Regular officer is accepted in the most extraordinary way. If he is tactful and if he is a good regimental officer, he is accepted at once, and I hope that this will continue.

THE CHAIRMAN.

In thanking General Ironside for his lecture, the Chairman remarked that Sir Edmund had enumerated the salient points of the work of the staff of the Army in the past, what a Staff Officer should learn, and how he should learn it, and the type of man the Staff Officer should be.

" General Ironside," said the Chairman, " is a past master in staff work and one who can improvise and make the best of the material he has at hand ; of this he has given several instances when in commands outside normal army work.

" There are, as Commander Lang said, many differences between naval staff work and the staff work of the Army and Air Force, but the foundation of a good Staff Officer is the same in the three Services. I hope those naval officers who are here this afternoon paid special attention to what the lecturer said, because, as Commander Lang reminded us, in 1914 there was no such thing as a Naval Staff. It is true there was a Chief and an Assistant-Chief of the Naval Staff at the Admiralty, and there was an Intelligence Department and an Operation Department, but a Naval Staff had not been created in 1914, and its formation had to be undertaken during the war. It has been built up since, and I hope, in spite of the attacks that are being made on it, it is going on improving rapidly.

" We now realize the advantages of staff work. We appreciate that it is a great benefit to be allowed to send two officers a year to the Staff College at Camberley and one to the R.A.F. College at Andover to widen our views on staff work.

" I do not consider that we yet have a fully trained staff, either afloat or at the Admiralty ; we have not yet had the long years of experience and training required, but the Navy will, in the near future, have the benefit of an efficient and sufficient staff."

The usual votes of thanks to the Lecturer and Chairman were then accorded.

AIR CO-OPERATION WITH THE FLEET

ITS LIMITATIONS AND USES

By Lieutenant Commander A. W. Clarke, R.N.

IN discussions on the employment and value of the air arm at sea, two extreme points of view often emerge. The optimist, impressed by the results of peace time exercises and experiments, contends that aircraft have revolutionized strategy and tactics, replaced in fighting value many classes of surface warships, and entirely altered the complexion of sea warfare. He draws alarming pictures of the naval action of the future, and complains bitterly of conservatism and lack of interest in the new arm. In fact, he is very much akin to the submarine enthusiasts in the days when they were wont to prophesy the speedy obsolence of the surface battleship.

The pessimist, on the other hand, deplores the waste of time and money on what he terms a fair-weather weapon. He draws attention to the enormous cost of highly vulnerable carriers, and to the low range of visibility and short radius of action of aircraft. He suggests that aircraft are being pressed forward at the expense of what would be wiser investments in surface craft.

It seems possible to find a happy mean between these two extremes. It is certain that aircraft have found their place in sea warfare, but as to how far they will influence naval activities it is more difficult to say. The last war did not provide any actual experience worth mentioning of aircraft co-operation in a fleet action. Ship-borne aircraft were employed on but few occasions: an attack on an airship; a few raids on shore stations; and a certain amount of reconnaissance. In fact the late war did not materially assist to solve the problem of how far the results of peace exercises to-day are likely to be modified under the conditions of a future war.

The extreme optimist contends that fighting aircraft will take the place of warships and that the command of sea communications will rest with the side that puts most aircraft into the air. He appears to lose sight of the fact that, for the present, the bulk of overseas trade must continue to be carried in surface ships. These ships remain at sea for long periods; they can travel by night; furthermore, they can be provided with a certain amount of protection in the shape of guns and

surface escorts to guard them against bombing and machine gun attack from the air, in much the same way as protection was afforded them against underwater attack in the late war.

Let us argue some more of his points. It is agreed that enclosed waters and focal points will provide great opportunities for aircraft, but such areas are also apparent to the threatened party which will, in all probability, be equally capable of providing air defence. On the open trade routes, it is very doubtful whether aircraft can menace shipping to the same extent as the surface raider; they certainly cannot protect it as efficiently as cruisers or auxiliary warships. As long as the necessity for these latter remains, so long must there be a battlefleet to support and protect them from more powerful enemy warships. Ultimately, the safety of communications may be decided by a fleet action, when the successful side will be left free to concentrate on the security of their trade and the destruction of that of the enemy.

It is, however, a short-sighted critic who refuses to take aircraft attack on merchant shipping seriously and, in particular, quotes the inconclusive effects of bombing attacks in the past. It is well known that the offensive powers of aircraft have increased immensely; to-day, attacks on ill-defended shipping centres and congested areas would, undoubtedly, inflict damage, serious both to material and, in its effect, on public *morale*. Yet this is the very situation that was met, and countered, in the Channel and approaches to British ports in the last war when the submarine was the great menace in these areas. The intensive submarine campaign was defeated by patrols, convoy organization and dark hour sailings. The same organization, with the important addition of the counter-offensive air patrol, should still meet the case.

The air needs of the Navy can be divided into those which will be met by ship-borne aircraft with the fleet and those which will require co-operation by seaplanes and flying boats working from shore bases. In comparatively enclosed waters such as the North Sea and the Mediterranean, air patrols maintained from the shore stations of countries bordering those seas must have their influence on the strategy of fleets. This influence was felt in the last war to a certain extent, but permanent patrols had not been developed to any great degree before hostilities ceased.

The great expansion that is foreshadowed, and that has as a fact arrived in air fighting forces, is likely to complicate, rather than to stultify, the activities of a fleet. Evasion and deception may often have to be practised by day while the real movements are made during the dark hours; but the cardinal problem of bringing an unwilling enemy

to action still remains. The advent of aircraft has brought its solution no nearer, indeed they may often assist him to avoid a meeting.

The optimist visualizes the maintenance of a continuous air patrol observing a hostile fleet during the whole time it is at sea. This is indeed optimism. To begin with, the fleet will have more than sufficient machines available to drive off the number of aircraft which could be maintained in the air at any appreciable distance from their base. It is admitted that it is beyond the capacity of the aircraft carriers with the fleet to maintain sufficient air patrols to preclude *any* contact by enemy aircraft; but such contact would, at best, be intermittent. The fleet, it must be remembered, carries its air base with it, while the shore base has to cater for the time elapsing between the departure of a patrol aircraft and its arrival on the beat plus the time it will take to return. The further the patrol area from the base the shorter the endurance time on the patrol, and hence the greater the number of machines required for any one permanent patrol.

Nevertheless future wars will, unquestionably, see the establishment of more or less permanent coastal air patrols, and the depth of such patrols will depend on the endurance and number of the craft employed. Operations, such as coastal raids by enemy surface craft, will in consequence be more difficult, and episodes like the escape of the "Goeben" will be less frequent.

Limitations of the Flying Boat.

The extreme optimist and the extreme pessimist are often in agreement on one point, that is the uselessness of aircraft carriers; but they see the matter from different angles. The one contends that the flying boat can and should replace the expensive carrier, while the other regards the carrier as a mere encumbrance to the tactics of the fleet and anticipates that it will probably be out of action by the time the battle lines are engaged.

The flying boat's capacity for accompaying the fleet must not be gauged in terms of radius of action, but in that of hours of endurance. The existing flying boat's radius of action is about one-sixth that of surface units of the fleet at war speed, while her endurance is only about one-tenth. Therefore, even if it is assumed that the rival fleets will meet within the radius of action of the flying boat from her base, it would still be necessary to refuel every aircraft at least twice in each twenty-four hours if it is to remain in company with the fleet and be ready for immediate action.

Where the fleet is at sea with the likelihood of a meeting with the enemy without much warning, the aircraft required in battle must be

ready for operation at any moment. A fleet of flying boats carrying torpedoes and reconnaissance and spotting personnel would require considerable organization in the form of special refuelling craft and the like, to keep it ready for immediate work. Such auxiliaries would be as vulnerable as aircraft carriers, and their protection would give rise to similar problems. There are, also, weather conditions to be taken into account.

If the flying boats are to remain at their base and only provide reconnaissance in a series of reliefs while the fleet is at sea, the area of fleet operations becomes restricted to one well below the radius of action of the flying boat. Even so there would be considerable delay before the full force of fleet aircraft could arrive, and, during the interval, the enemy, operating from carriers, let us suppose, would hold the mastery of the air. The synchronization of attacks would also prove still more difficult.

Flying boats can undoubtedly be of assistance to a fleet, but carrier-borne aircraft must be provided if the fleet is to be assured of having aircraft ready for immediate action.

The Best Type of Aircraft Carrier.

The pessimist's contentions as to aircraft carriers must be admitted to a certain extent. The movements of a carrier while operating aircraft are governed by the direction and force of the wind and the demands made upon her as to aircraft.[1] Moreover both fleets will make efforts to sink the opposing carriers, and both sides will endeavour to obtain a position of advantage relative to the wind. At the same time the carrier has a high turn of speed and is capable of maintaining a safe distance from the enemy's main forces; but this may be at the expense of her aircraft value. In other words, the outmanœuvred side must resign itself to a curtailed supply of machines, even though this does not necessarily mean the actual loss of any carriers.

With unlimited building the solution would be simple. A fleet could then possess sufficient carriers to station them so that whatever the direction of approach of the enemy a reasonable number would be free to fly off their aircraft. In other words the fleet would be provided with a reserve of carriers above the normal requirements for action. This is a most unlikely event, and the problem becomes one of how best to invest the money available for carriers.

At first sight a number of small carriers seems preferable to a few large vessels. The loss of one carrier then becomes of relatively smaller

[1] See "Aircraft Carriers in a Fleet Action" by the same author—R.U.S.I. Journal, August, 1926, p. 521.—Editor.

importance and there is less chance of the majority of the fleet aircraft being placed in such a position that they could only be operated with danger to the carrier. On the other hand, the smaller carrier cannot mount the same protective armament, and she is at once more vulnerable to attack from light craft. She is more susceptible to the weather and will not provide as steady a landing platform as the bigger ship. On the side of expense the cost of two small carriers would be considerably greater than that of one twice the tonnage.

There are, however, limits to the usefulness of the large carrier. The most important is that, although the size of the carrier can be increased more or less indefinitely, the number of aircraft that can be operated from it does not increase proportionately. The number of carrier-borne aircraft that can be operated is not limited solely by her size; it is limited also by the efficiency of the carrier in respect to the time during which the flying decks are occupied with launching or landing aircraft. As an example, two 11,000 ton carriers could each be designed to carry 15 machines; while a 22,000 ton carrier might be designed for 34 machines. Under certain conditions of weather the two smaller carriers will, together, be able to operate 30 machines, while the large carrier will be unable to operate a similar number due to deck limitations. It is apparent that with designs on existing lines a carrier can be built to carry any number of machines; but, beyond a certain average figure, additional machines will only exist as replacements to casualties. A carrier carrying, say, 70 machines will never be able to place them in the air together with any hope of recovering them again. The large carrier, however, is of value as a transport of assembled or partially assembled aircraft for subsequent operation from a shore base.

As far as sea work is concerned it looks as if a sufficient number of "Hermes" type of carriers would provide a more certain service of aircraft. If expense precludes this, then a compromise in the shape of a lesser number of medium-sized carriers, such as "Furious" or "Eagle," sufficiently large to carry the full number of aircraft that can normally be operated and with a small reserve for action replacement, offers the best alternative. The construction of monsters such as the U.S. "Saratoga" with a reputed capacity for seventy to eighty machines is putting too much reliance on the safety of the carrier, and neglecting sound consideration of the proportion of the aircraft carried that can be expected to play any part in action.

The medium-sized carrier can be sufficiently armed to keep light craft at a respectful distance, and for further defence her tactics must be such as to place her within cover of her own battlefleet, should her safety be in jeopardy from enemy concentration. Finally, the decision

as to whether the safety of the carrier is of greater importance than the provision of more aircraft must be based on the action situation at the time. It must be realized that this may often necessitate refusing machines already in the air the opportunity of landing on.

Fleet Aircraft.

Experience is yet required as to the proportions of the various types of aircraft that should be carried with the fleet. They can be divided under three broad headings; machines suitable for reconnaissance and action observation, torpedo-carrying aircraft and fighter machines.

Reconnaissance.

In reviewing the activities of aircraft in the fleet, reconnaissance must be placed first in order of importance. Early, continuous and accurate information of enemy movements is of the greatest value to the commander of a fleet. For this work aircraft have the special advantage of possessing a high standard of mobility, while their commanding position makes for accuracy in reporting an enemy's course and formation. A cruiser screen would take ten hours to advance a hundred miles ahead of the fleet where aircraft could take up a similar station in little over an hour. On the other hand the radius of visibility from aircraft is often exaggerated, and there are many occasions when their vision is limited to that obtainable by surface craft. At present, moreover, aircraft cannot attain the same accuracy in position keeping as a surface ship.

The contention that aircraft can replace the cruiser screen is not borne out in practice. Air reconnaissance is of little or no value at night, and aircraft cannot screen the fleet from enemy surface reconnaissance. Both these duties must still be performed by the cruisers of the fleet, but, in suitable weather, the employment of aircraft will permit the cruiser screen to be concentrated before contact with the enemy, whereby the cruisers can move at once, on the aircraft reports, to break up the enemy surface screen. There must still remain many occasions, however, where aircraft reconnaissance could not be carried out; such as in heavy weather, low visibility, and when adverse winds would reduce the carrier's endurance too far for flying on and off reliefs over a long period.

Once the Commander-in-Chief is in possession of sufficient information regarding the enemy's movements and composition, the battlefleet can be deployed to best advantage. When battle is joined the function of the reconnaissance aircraft becomes what can be termed action observation. There is no question as to its value, for additional channels of information are always an asset, and aircraft will, often, give better facilities for observation than surface craft.

Observation, by itself, however, is of little value without good communications. An examination of the signal records of a fleet action, such as the Battle of Jutland, demonstrates immediately the quantity of messages that flood the offices of the fleet flagship on such an occasion. The signal department have now to face the imposition of an additional strain in the form of aircraft communications. It must be pointed out that the essential signal links between the aircraft and the directing authority may break down for a multitude of reasons. To this is added the unreliability of positions given by aircraft and the difficulty of identifying casualties in the air. In view of the lack of experience under battle conditions, it seems sound therefore that reliance should not yet be placed in air reconnaissance and observation to the exclusion of the existing surface organizations.

It is hardly necessary to repeat that aircraft will not be left untroubled to pursue their functions. They will be subjected to attack by fighters and anti-aircraft fire at intervals, and the replacement of casualties may not be possible owing to the carrier's preoccupation. Here again, peace exercises can provide little data.

Generally speaking, air reconnaissance and action observation will be a definite advantage to a fleet provided the weather is suitable; but the extent to which the fleet organization can rely on the same must depend on the amount of attention the enemy pays to offensive fighter tactics against the observation machines.

Torpedo Carriers.

Turning now to torpedo plane attack, we are once more faced with a lack of data. The optimist quotes the effect of attacks carried out in exercises against isolated ships and, in particular, against the head of the battle line. The pessimist contends that the fire that would be brought to bear against these aircraft would entirely disorganize any effective attack.

There are, obviously, the best moments for torpedo attacks and continual investigation will prove at what stage of a battle torpedoes fired from aircraft are likely to be most effective.

To achieve success the aircraft must make every effort to reduce the interval during which they are under observation. Opportunities to attack are not difficult to foresee and it is certain that if the aircraft time their moment well the targets will have only a few minutes in which to decide on the method of evasion to be employed. The low range and high speed torpedoes used by aircraft can be dropped sufficiently close to their targets to make nothing less than drastic and immediate avoiding action effective. This is somewhat disconcerting to the proper

control of a battle line. If the aircraft attack when the line is already engaged with the enemy, the time available will not be sufficient to bring effective fire to bear on the attacking machines. It would be necessary to shift target and probably reload with a different type of shell. It is difficult to judge what will be the effect of gunfire directed at aircraft in the heat of battle, and the casualties imposed in peace time are, generally speaking, assessed on the calculations of theoretical results.

So far, therefore, the advantages appear to lie on the side of the aircraft; but they will be faced with many difficulties which do not exist in peace practice. Torpedo flights will not be left unmolested. They will be attacked by fighters who will try to break up their formation. There is also the moral effect in action of leaving a carrier, probably under fire at the time, with the knowledge that it is more than a possibility that there will be no carrier to return to on completion of the attack. Although the effect of gunfire defence is as yet a somewhat doubtful quantity it cannot be written off as negligible. Whatever method of air attack is employed, gun blast, cordite smoke, water splashes and the general disturbance of the air with two battle lines in action must be factors in marring the ideal attack.

Progress has always met each new method of offence with an efficient method of defence, and the optimist who visualises a broken and sinking battle line at the end of the enemy's aircraft attack is no more reasonable than his predecessors who conjured the same picture out of torpedo boats or submarines. Defensive methods will develop step by step as the offence becomes more intensive. Again, if the extent of the air menace to a fleet is analysed, it will be found that it is directly proportional to the striking force that can be placed and maintained in the air which, again, is strictly limited by the carrier tonnage available on the scene. The continual stream of torpedoes launched from the air, which, in theory, are to completely disorganize the battle fleet is not a practical proposition. It requires some fifty torpedo planes in one attack to equal the torpedo menace of a single destroyer flotilla. It is true that the warning of an air attack is considerably shorter, but the necessary drastic action to minimise the results of such an attack can be taken, and, once the attack is passed, the battle fleet will be able to count on a considerable respite before it could be repeated. To produce effective results aircraft must attack in large numbers. This will call for a high standard of organization between carriers to ensure synchronizing the attacks of the various torpedo flights. Once again the factor of communications enters the field.

No Commander-in-Chief will ignore the necessity for counter offensive to reduce the air menace. The carrier's existence will be hazardous in

the extreme. Whatever the defences provided she will be liable to attack by bombs, torpedoes or shell fire. Even though she may avoid actual damage, a carrier may be forced to abandon a prearranged plan and obliged to seek cover under the guns of her own fleet. This would completely disorganize concerted action with her consorts. In fact the only safe deduction to be made from peace exercises is that a high percentage of hits can be obtained by one or more flights of torpedo machines, but only provided that they reach their firing positions successfully.

Fighters.

Fighter machines, flown both from units of the fleet and from carriers, can be employed to attack enemy observation and torpedo or bombing aircraft, or to shoot at exposed personnel in surface ships.

The capabilities of the carriers being limited it is necessary to weigh the merits of providing a greater proportion of fighter machines to other types or vice versa, the total number of machines remaining necessarily more or less constant. The successful side will be the one whose organization is sufficiently flexible to allow a readjustment of the numbers of various types as the situation changes. It may be necessary to maintain a high percentage of fighters in the air in the early stages of an action to cover torpedo attacks and protect observation machines. Later, air supremacy may have been achieved to a large extent and it would be possible to reduce the number of fighters and correspondingly increase the numbers of other types of aircraft in the air.

If there is to be any subdivision of duties among fighters, it would seem that the organized flights from carriers should be employed on aircraft attacks, and that the individual machines flown from units of the fleet, possibly at varying times, should be allowed to take free-lance opportunities as they occurred. These aircraft will be handicapped by the problem of finding an unoccupied carrier on the completion of their endurance, or the more unpleasant alternative of landing in the water.

Conclusion.

It seems fair to conclude from the foregoing review of fleet aircraft capabilities and limitations that the optimist is over enthusiastic and the pessimist unduly despondent. To sum up, aircraft co-operating with a fleet possessing a flexible organization between carriers, will be a useful weapon in the hands of a Commander-in-Chief; but allowance must be made for action conditions that cannot be simulated in peace time exercises and which may modify appreciably peace time conclusions.

Aircraft will complicate naval battle considerably. Secrecy of movement at sea is rapidly vanishing and fleets must rely more than

ever, for strategical movements, on the dark hours. The new arm makes further demand on light craft for the defence of the battleline and carriers. In these days of small fleets the problem is to draw the line between the lowest number of such craft essential for the defence and the greatest number that can be spared for offensive work.

Very considerable advance must yet be made in self-supporting aircraft, such as flying boats, before their endurance as well as their radius of action can approach that of surface ships. Until then they cannot take the place of carrier aircraft. Aircraft carriers in some form must, therefore, accompany the fleet wishing to meet the enemy on equal terms in the air at short notice.

The problem of the carrier's defence is a serious one and may have considerable effect on the tactics of the fleet. The carrier has a high rate of speed, but she is yet very vulnerable as far as her aircraft operating value is concerned, and severely restricted as to her movements by the weather and the operation of machines. The tactical situation is further complicated by the fact that a squadron of carriers will become dispersed very shortly after the commencement of flying duties, even if it has not already been necessary to separate them in the cruising formation.

In the circumstances it would appear that the fullest possible use should be made of aircraft during the early stages of a battle, but that, at all times, the assistance provided by aircraft must be considered in the light of additional aids to the fleet and not as permanent substitutes for duties now performed by surface units.

Let us continue to examine and try out these ideas as exhaustively as peace time exercises permit, and, avoiding a too facile optimism and a too conservative pessimism, regard the future of aircraft at sea with the eye of vision.

SECOND (MILITARY) PRIZE ESSAY FOR 1927

SUBJECT:

"PRIOR TO 1914, THE CENTRE OF GRAVITY OF MILITARY AFFAIRS WAS UNMISTAKABLY IN EUROPE. WE STILL HAVE MILITARY COMMITMENTS IN EUROPE IMPOSED ON US BY TREATY OR PACT, BUT THE CENTRE OF GRAVITY IS NOW NOT SO CLOSELY DEFINED.

"DISCUSS THE ORGANIZATION AND TRAINING OF OUR MILITARY FORCES, HAVING REGARD TO THE SITUATION OF TO-DAY."

By CAPTAIN J. KEITH EDWARDS, M.C., Scots Guards.

MOTTO: "MACHINE POWER OR MAN POWER?"

I.—OUR PRESENT MILITARY SITUATION.

(1) *The Position in* 1914.—The true turning point in our pre-war military policy was the year 1905, in which Mr. (now Lord) Haldane became Secretary of State for War. 1904 had seen the signing of the Anglo-French Agreement which, while terminating many Anglo-French incidents overseas, pledged us to give France diplomatic support in Europe. In 1905 came the renewal of the Anglo-Japanese Treaty with certain amendments which to a great extent relieved us from military anxiety in the Far East. In 1907 the Anglo-Russian Convention ended the long-standing friction between the two Empires in Central Asia, Persia and the Near East. This period coincided with the determined attempt of Germany to build a fleet which should prove a rival to our own, while her statesmen embarked on a series of diplomatic offensives which seemed destined to precipitate an armed conflict. Lord Haldane met the situation by creating the military organization which was existing in 1914.

Training in the pre-war Army was considerably less involved than now. Infantry was armed exclusively with the rifle and bayonet and, although machine guns had been considerably developed in the German Army, two machine guns per battalion were considered sufficient to augment the fire power of our own infantry. Mechanical support was limited to artillery; tanks were unknown; the Flying Corps was

in its infancy, while co-operation between arms or between ground and air hardly existed.

The important points to note are the simplicity of the organization and training of our 1914 Army and the fact that with minor adjustments it was suitable for employment in any theatre of war, against practically any type of enemy. It was also adequately organized and trained for providing the garrisons overseas and for the maintenance of internal security.

(2) *Political Factors affecting the Situation To-day.*—The League of Nations exercises an important influence on the problem of the Military Organization of the Empire, owing to three classes of military commitments in which members of the League are involved. These are:

(*a*) Commitments under Article XVI of the Covenant of the League;

(*b*) Commitments as member of the Allied and Associated Powers signatory to the Peace Treaties;

(*c*) Commitments as signatories to the Locarno Pact.

Under Article XVI of the Covenant the Government is liable to be called upon to provide naval, military or air force to protect the Covenant of the League. Further, any Power which shall resort to war in disregard of its Covenants under Articles XII, XIII or XV shall *ipso facto* be deemed to have committed an act of war against all other Members of the League. It follows that Britain might find herself involved in war against a Power against which she had no specific quarrel involving her particular interests.

As a signatory power to the Treaties of Versailles she is liable to be called upon to intervene in Europe in the event of gross contravention of the Terms of the Treaties on the part of our late enemies.

Lastly, British commitments under the Locarno Treaties are even more arbitrary. We have guaranteed the existing frontiers of France, Germany and Belgium and are pledged to resist any aggressive action aimed at the rectification of these frontiers.

It is evident that we have undertaken military commitments in Europe of a gravity which pre-war Governments were never even called upon to consider; this, moreover, at a period in our history when naval predominance is no longer our sole protection, and when the problem of our defence is complicated by the air and under-sea menace.

As compared with the period immediately preceding the Great War when our position in the East was largely secured by the Anglo-Russian Convention and the Anglo-Japanese Alliance, the situation in the Middle East and Central Asia is now unfavourable and must be considered a

potential area of unrest. Our interests now lie in proximity to a power dominated by militant communism and never tired of proclaiming the British Empire to be the principal obstacle to the realisation of its dream of world revolution.

In the Far East the gradual process of disintegration in China provides a fruitful source of intervention by Foreign Powers. As the result of the substitution of the Three-Power Pact for the Anglo-Japanese Alliance we have no ally in the Far East.

From the foregoing it appears that the British Army has to be prepared to fight against a Great Power either in Europe or in Asia; in addition it may expect to have to operate in a small war in almost any part of the world.

(3) *The Development of Air Power.*—The advent of air power has destroyed our insularity. The capital of the Empire and a considerable portion of our industrial areas are within bombing range of the air forces of more than one of the Great Powers of Europe. We are not in a position to attack the capitals and industrial areas of our enemies with the same facility as they can attack ours. It follows that the independence of the Low Countries is more than ever important to the security of these Islands. It is further evident that in the event of our becoming involved in a European War our strategical plan will be strongly influenced by the necessity of securing those areas from which air attacks on this country can most easily be launched. Rapid and decisive defeat of our enemies in conjunction with a European Ally will be the most effective method of providing against the perils of air attack.

On the other hand, air development has given rise to another possibility, one entirely favourable to our defence measures. The employment of air units to maintain order and security in undeveloped regions is of the greatest assistance in a maintenance of economy of force. The success of punitive expeditions in regions formerly inaccessible, and the great moral effect of air offensives in desert areas suggests the possibility of maintaining far fewer troops for garrison duties in such regions.

(4) *The Submarine Menace.*—Up to the Great War we were able to organize our defence measures on the basis of sea supremacy. Command of the sea is still the cornerstone of our defensive structure. But from being a purely naval problem, command of the sea has become a problem which can only be solved by the co-ordinated efforts of combined sea, air and land forces The influence of the Channel Ports on recent military operations in France and the campaign fought to preserve the security of the Suez Canal are appropriate instances of military effort to assist the Navy in the maintenance of sea communications.

The history of the submarine campaign against our lines of communications will not be easily forgotten. Maritime defiles on our sea communications may in future rank among the principal military objectives of an enemy.

The Mediterranean is a maritime defile through which passes our principal line of communication to India, the Far East and Australia. Our policy for more than a century has been directed towards preventing a potential enemy from obtaining a strangle-hold on this artery. With the advent of the submarine and air weapons the situation to-day is that war with a Power possessing submarine harbours and air stations along the European and African coasts of the Mediterranean would probable result in the loss of this line of communication. The surest way of defeating this menace is energetic and decisive action by our land forces in conjunction with a European ally. The pressure on our lines of communication might become so intense that we should be unable to muster the full quota of our Imperial resources. Success may thus depend on the strength and rapidity of our initial blow on land.

II.—Factors Peculiar to Ourselves Governing our Military Organization.

(1) *Finance.*—It must be accepted as an indisputable fact that no organization which involves any additional financial expenditure can be considered as practicable.

(2) *The Voluntary System.*—Whatever may be the likelihood of a British Government introducing conscription on the outbreak of a great war, it cannot, under any circumstances, be assumed that this country would submit to any form of compulsion in peace. Our military organization must, therefore, be based on the voluntary system which in turn involves a professional army. As recruitment for such an army has to compete in the open market with industry, a high rate of pay with attractive terms of service becomes a necessity. The result is to be seen in a high expenditure with a comparatively small result as regards numbers and striking power.

The variety of circumstances under which our Army may be called upon to fight constitutes by far our most difficult military problem. We have, accordingly, to ask ourselves:

(*a*) Is a compromise by which our Expeditionary Force is "as nearly as possible" suitable for a campaign in any theatre of war admissible as a solution?

(*b*) Is the elasticity which occupies a prominent part in our present policy really compatible with the preparation required to meet conditions of modern war?

(*c*) Are we certain that on the outbreak of war we shall not have to make an ill-considered choice between improvisation, or embarking on a campaign under all the disabilities of inferior armament, mobility and organization?

III.—Organization and Training.

(1) *Regular Army.*—The organization of the Army is based on the Cardwell System, i.e., men serving a proportion of their engagement with the colours and the residue with the reserve. Units stationed at home are on a peace establishment, while they find drafts for their linked units abroad on a colonial establishment. They are also grouped in formations to form an Expeditionary Force, being brought to war establishment by calling up reservists on mobilization.

(2) *Territorial Army.*—This organization is to be the medium of expansion to meet the requirements of a great war, the peace establishment being such that the incorporation of a large number of civilians and their subsequent training are necessary before units can take the field.

(3) *The Army in India.*—This Army comprises Internal Security Troops to ensure tranquility in India during the absence of the Field Army, Covering Troops to ensure that the mobilization and concentration of the Field Army is carried on undisturbed, and the Field Army itself, a striking force able to undertake service on the borders of, or beyond, India.

(4) *Dominion Forces.*—The Dominion Forces are all based on some system of compulsory universal training in a citizen force. Their organization is generally similar to that of our own Territorial Army, while war establishments approximate to British standards.

(5) *Training.*—We train for a war of movement as opposed to the static warfare so typical of the Great War. The avoidance of static conditions and the endeavour to force an early decision before enormous masses of men and material are brought into the field constitute a military policy common to all nations. Thus mobility becomes the keynote of equipment, organization and training.

But the development of the machine gun has resulted in decreasing the battle mobility of infantry, so depriving this arm of its power of closing with the enemy—hitherto the decisive act in battle. This characteristic once made infantry the basic arm. Consequently one of the main problems of post-war training and organization is how to neutralize the fire of machine guns with such effect as would enable infantry to carry out its traditional rôle.

Fire being recognised as the dominant factor in war, the tendency has been greatly to increase the fire power of infantry, by multiplying the number of machine guns and light automatics in a battalion, and by giving the infantry soldier numerous other weapons to assist him in closing with the enemy. This increase of machine guns, presumably arising out of the assumption that the answer to machine guns in defence is more machine guns in the attack, appears to be based on a false conception of the problem. Accurate location of the target is an essential condition to the successful employment of machine guns. These weapons are unsuitable for plastering any area with the certainty of hitting whatever is there. Now, accurate location of the target is precisely the crux of the problem of directing the fire of the attacking side, and the answer does not appear to lie in increasing the number of machine guns. If these weapons are carried on an armoured vehicle having cross-country capacity, and can seek out the enemy at short range and fire from the vehicle, their value is enormously enhanced, but their characteristics become those of an armoured fighting vehicle.

Again, increased artillery support is no solution to the problem of neutralizing the effect of machine-gun fire in defence, because increased demands on gun ammunition will immobilise the supply system and reduce the mobility of the force as a whole.

Tanks, by combining fire power, mobility and armoured protection, are the ideal weapon for dealing with machine guns. As development of this arm proceeds and existing limitations are overcome, their successful employment will no longer depend on close co-operation with infantry, which arm will in future, by its immobility, impede rather than assist the tank. The tendency, therefore, is for tanks to become the basic arm with which the eventual decision in battle will rest.

To summarize briefly: Infantry Training, by reason of the number of weapons with which the infantry soldier has to familiarize himself, and the more intimate knowledge of other arms which co-operation now demands, has reached a stage of great complexity. The development of weapons and armoured fighting vehicles having far outstripped war experience, our tactics require radical modification. Tactical theory can only be formed as the result of research, hence our organization, training and equipment became largely experimental.

The problems demanding solution are:

(*a*) To what extent does infantry remain the decisive arm in battle?

(*b*) How are we to protect the infantry, on the move, at rest, and in battle, from aircraft and armoured fighting vehicles without further reducing its mobility?

In answer to these questions it would appear that:

(i) The decisive rôle formerly played by infantry is passing to the armoured fighting vehicle, the tendency being for the tank to become the basic arm;

(ii) All arms appear to require certain common characteristics in order to function efficiently under modern conditions. These characteristics are armoured protection and cross-country mechanized mobility.

IV.—Where our Organization Fails.

(1) *The Weakness of the Expeditionary Force.*—Owing to European commitments and to the effect of scientific developments on our strategical situation, circumstances may arise in which the security of Great Britain and of our communications may be dependent on rapid and decisive action on the Continent in conjunction with a European ally. Yet, with our present organization, it is inconceivable that we could take a decisive part in the initial stages of any European campaign. Although our political influence predominates in the councils of Europe, yet as soon as political give way to strategical considerations our influence sinks down to that of a second-rate power. Owing to our inability to exert a decisive influence on a Continental military situation, we are obliged to sacrifice our strategical interests and subordinate our plans to those of a European ally. Further, if we wish to strike decisively on land, we are obliged to utilise the lengthy and expensive process of organising armies upon a national scale before we are in a position to impose our will upon an enemy. We are then likely to be in the unenviable situation of finding ourselves committed to a military policy in the initiation of which we had no voice owing to the unimportant part which our military organization played on the outbreak of war.

History has taught us that defeat of an enemy by naval measures alone is a slow process. Efforts to reduce the vitality of our opponents by naval blockade may be frustrated by political considerations, or, if persisted in, may add to the number of our enemies. These two factors, naval and military, seem to show that, organized as we are to-day, we must, if drawn into a European war, expect a protracted struggle with all its attendant disadvantages of expense and demoralization, and the grave danger of defeat in detail owing to the enforced policy of piecemeal employment of military detachments as they become ready for war. Lastly, a long and indecisive campaign in Europe allows the enemy to take full advantage of our strategical weak points under the sea and in the air. It is therefore evident that to maintain the security of the Empire in the event of our becoming involved in European war it is essential that action against our enemies should be rapid and decisive.

Our present organization fails in that it does not provide a force capable of exercising a decisive influence in a European war. Our military forces are organized and trained primarily for small wars. The reasons underlying this policy are more historical than practical. It is true that the extent of our responsibilities has in the past involved us in frequent small wars. But during the last generation conditions have vastly changed. Since the doctrine of the small war was formulated, the world has been partitioned and re-partitioned until our neighbours overseas are no longer largely composed of backward, ill-armed and ill-governed peoples; they are rather protectorates and spheres of influence of Great Powers. As the possible theatre of the small war is rapidly disappearing so we find immense areas of potential friction between Great Powers.

It follows that our traditional policy of preparation for small wars requires drastic revision. The few remaining "potential theatres of small wars" require study. A distinction must be drawn between those areas where hostilities would take the form of organized rebellion of armed tribesmen, such as the Mesopotamian revolt; or the rather similar conditions ensuing from an invasion of our territory by armed tribesmen; or a war against powers such as Afghanistan or Turkey. In either case the developments of science have profoundly influenced the situation, since science is ever on the side of organized government.

Against organized rebellion by armed tribesmen, intensive air offensives supplemented by armoured cars and a minimum of infantry transported by aeroplane or lorry is probably the most effective action.

In the event of war against a minor Power possessing a military force with limited artillery, with probably no tanks and an inefficient air force, surely our answer does not lie in imitating as far as possible an organization forced on our opponent by lack of money, industrial organization and scientific development. On the contrary, our purpose should be to develop to the utmost our advantages in machine power.

Finally, as regards small wars, it is true that we have to reckon with the enormous difficulties of applying scientific weapons and machine power to a campaign in regions where climate and terrain may be the deciding factors. Nevertheless, the solution of the problem of the application of science to such campaigns will inevitably be retarded if our organization is based on the assumption that in order to maintain mobility we must sacrifice fire power.

The history of numerous small wars in the past shows that our armament has not been so vastly superior to our enemies, that discipline has been our principal advantage; on the other hand, it appears that these great advantages have been largely offset by immobility.

Mechanized mobility and the substitution of machine power for man power are assets which the armed tribesman and the third-rate Power can never hope to imitate.

(2) *The Territorial Army.*—As an inexpensive second line organization the value of the Territorial Army is difficult to over-estimate Moreover, the successful part it plays in our defensive organization is largely due to the traditional zeal and spirit of self-sacrifice with which its personnel give their time, and incidentally in many cases their money, to the service of their country.

The function of that army is to produce on the outbreak of a great war an organization capable of—

(*a*) absorbing a large number of civilians and training them in Territorial units so that in a space of six months they are capable of taking the field;

(*b*) expanding to form two or three units where one existed before.

As regards (*a*), if 1914 be any criterion, no shortage of the finest material the country can produce will be experienced in the first few weeks of a war. As regards (*a*) and (*b*), it is evident that an enormous responsibility rests on the Territorial officers and N.C.O's. who will be the trainers of a national army.

It follows that officers and N.C.O's as the potential trainers and leaders of the national army in a great war should be of the highest type available, and that the limited amount of time and money available should be concentrated on training these leaders. Next in importance to leaders and trainers come those specialists who cannot be adequately trained in the "embodied" months.

The nature of the Territorial organization thus demands that specialization should not merely be permitted but encouraged. Six well-trained specialists will be worth fifty ordinary privates on an outbreak of war. It follows that if the desired results are to be obtained on embodiment, we have to concentrate on these essentials—Trainers, Leaders and Specialists.

Under present conditions are these results being obtained? Probably it is no exaggeration to state that 75 per cent. of their available time is spent by the Permanent Staff, who theoretically are the trainers of the Territorial Army, on administration. A further 15 per cent. of their time is probably spent on training privates to be privates, i.e., neither specialists nor leaders. And as a clear four months must elapse before Territorial units can take the field, the training of privates is their least essential duty. On this approximate estimate about 10 per cent. of their very limited total time available for training is devoted to the preparation of specialists and leaders for war.

It is said that every private is a potential N.C.O. for war. Theoretically this should be so; but in practice, as happened in 1914, it will be found that the personnel who as civilian volunteers will flood the units on mobilization will be of an infinitely higher type than the Territorial Army can ever hope to attract in peace. The pick of these recruits will, by reason of personality and education, rapidly outstrip the majority of peace-trained privates in military knowledge and ability.

A very real anxiety exists among the more zealous Territorial officers regarding the future. Training in the Regular Army has reached a very complicated stage. The Territorial cannot hope to compete with the Regular Army in training in all the weapons with which the latter is familiar. Yet the day of the "hedgerow rifleman" is obviously past. The advent of mechanization, its application to transport and weapons, the more intimate knowledge of the characteristics of the other arms which successful co-operation demands, anti-gas, anti-aircraft and anti-tank measures are all half-veiled mysteries on which the enthusiastic Territorial officer now clamours for enlightenment.

In short, the present Territorial organization requires adjustment because:

(*a*) being modelled on the Regular Army, yet having but a fraction of the Regulars' time at their disposal, the trainers of Territorials are overwhelmed with administration, when they ought to be training leaders and specialists;

(*b*) the widening gulf between the Regular and Territorial Armies in equipment and training adds to the many difficulties with which the Territorial officer is faced;

(*c*) the Territorial private, although the least essential part of that organization, absorbs about 90 per cent. of the time available for training and costs a very considerable part of the available money.

(3) *Mechanization.*—The scientific development of armoured fighting vehicles, combined with the gradual elimination of the foot soldier and the horse, aiming at the eventual production of a completely mechanical field army renders possible the production of a striking force within the limit of our financial resources and with a striking power commensurate with our responsibilities. But under our present organization a continued and methodical progression in this direction is not possible. In fact, we have already reached a stage where the existing organization is strained to breaking point, and where the progress of mechanization is hindered in the attempt to perpetuate a system designed many years ago to meet totally different conditions.

(4) *India and the Cardwell System.*—One of the essential conditions of the Cardwell System is that the organization, equipment and training of all our military forces should be on similar lines. If the organization and training of our overseas garrisons differ materially from that of the Expeditionary Force units engaged in training the drafts for the overseas garrisons, then obviously the whole system breaks down. This is precisely the situation to-day. At home we have infantry battalions with sixteen machine guns; cavalry regiments with eight; infantry platoons with two Lewis gun sections. The provision of anti-tank weapons as an integral part of an infantry battalion is a present necessity and a future certainty. The mechanization of all first-line transport and machine-gun transport is generally acknowledged as a pressing need, financial stringency being the principal obstacle. Some field artillery and all medium artillery brigades are mechanized. Anti-gas, anti-aircraft and anti-tank training are important features in training and equipment.

What is the situation in India? Are the essential conditions of the Cardwell System being maintained? The answer is well-known to all who have any experience of the present situation, while it is clear that the attitude of the military authorities in India towards the application of scientific developments to military equipment must necessarily be influenced by considerations of climate, terrain and the role of the defence forces of that country.

(5) *Training.*—Simplicity is the first principle of any sound organization, and in an Army with a short colour service simplicity should be the keynote of its system of training.

Our present system of training is extraordinarily complicated largely because we train one man for two different organizations which might be termed continental and colonial. The numbers of men available for tactical training at home under the Cardwell System are hardly ever sufficient to give junior leaders a practical picture of what their units would look like at war establishment. Any continuity of training in units finding drafts for "linked" units abroad is in reality impossible owing to the fluctuation of numbers as the result of finding drafts. When the Cardwell System was introduced this difficulty was hardly felt because training in the infantry consisted mainly of drill and musketry, with an occasional "field day" or "review."

To-day the platoon commander has to train in six different weapons. Tactical training is highly complicated; co-operation with other arms demands a knowledge of their characteristics; education and physical exercise are important features in a soldier's training; specialist training is vital. Yet the system is practically the same and the man who proceeds to India with a draft completes his colour service in a totally different

atmosphere, with different equipment, organization and methods of training. It is difficult to see how the passing of men into reserve service with highly confused ideas can be avoided under this organization. No peace training of men on the reserve has taken place since the war.

Stated briefly, our present organization fails owing to the increasing strain on the Cardwell System, the difficulty of harmonizing the conflicting claims of India and those of a modern battlefield, the highly involved state of our training and equipment, and the widening gulf between the Regular and Territorial Armies. Lastly, under the existing system we are unable to take full advantage of those scientific developments which provide an unexampled opportunity of compensating for the lack of striking power inherent in a small professional army.

V.—The Solution of the Problem.

(1) *Our Dual Requirements.*—It is clear that our military requirements fall into two main categories which may summarily be styled :

(*a*) *Continental* : Great wars, or wars in which the existence of the Empire is at stake ;

(*b*) *Colonial* : Overseas garrisons, small wars, and internal security.

To meet this situation, it is suggested that our military organization should be worked out on the following lines, that is, it must adapt itself to our varying needs. This entails organizing :—

(i) *A Continental Army*, or Striking Force ;

(ii) *A Colonial Army* ;

(iii) *A Territorial Army*, organised on a cadre basis and designed to be the medium of expansion for the Continental Army.

(2) *Characteristics of the Continental Army.*—This force would be the principal Imperial Striking Force. Its outstanding characteristics would be *mobility*, fire power, and striking power. The divisional organization would remain and the Force would consist of four Divisions. Mechanical mobility would be developed to the fullest extent by a methodical substitution of the muscle power of man and horse by the machine power of armoured fighting vehicles. Progress in this direction must depend on successful research and experiment, also on the utmost financial economy in the Army so that money saved by reducing man power might be available for machine power. The ultimate aim, which might well take many years to realize, must be the production of a force capable of moving a hundred miles in a day over most kinds of ground and in most climates, and fighting a battle at the end of its march. No detailed description of the organization or equipment of this force need be attempted. The lines on which it would evolve must depend on the result of unhindered experiment.

(3) *Personnel.*—Personnel (exclusive of officers who would be on a general list), would be specially enlisted for service in the Continental Army. A short colour service, say, three or four years, with the balance of twelve years served on the Reserve, would ensure a large Reserve. No drafts would be found for overseas garrisons, consequently peace strength of units would be uniform. Recruits would complete all preliminary training at centralized depots, one in each command. The more highly technical personnel would be required to serve longer with the colours.

The present system of command and administration of Divisions of the Expeditionary Force could remain.

(4) *Colonial Army.*—The Colonial Army would consist of:—

(*a*) units required for overseas garrisons, including India, on a colonial establishment;

(*b*) certain unallotted units stationed at home on a minimum peace establishment, organized, trained and equipped on a colonial system. The rôle of these units, which could be organized in brigade groups, would be reinforcement of overseas garrisons as and when required, relief of overseas garrisons, and small wars where a small independent force was required to co-operate with air units and armoured fighting vehicles;

(*c*) a Colonial Army Reserve, consisting of personnel of the Colonial Army whose term of colour service has expired. A proportion of these reservists would be organized in a Section "A" Class in order that they should be available to bring units to a colonial establishment without resorting to mobilization.

Personnel of the Colonial Army would be entirely separate from the Continental Army and would be enlisted for seven years' colour and five reserve service. Training of drafts for overseas would be carried out at Command Centralized Depots in composite training battalions. Thus the peace establishment of Colonial units serving at home would be uniform, the place of men passing to the Reserve being taken by trained drafts from the depots. The number of these Colonial units serving at home would be reduced to the absolute minimum consistent with the efficient performance of its rôle.

A serious criticism of this Army lies in the question of reliefs. With not more than eight battalions at home how would reliefs be carried out? The problem of the other arms would be similar. The answer would appear to be that units would remain at home a much shorter period than at present, in order that the movement of units on the

foreign roster should not be unduly restricted, while some system of leave for other ranks serving long engagements with the Colours abroad would have to be considered.

(5) *The Territorial Army.*—Under the suggested organization Territorial units would be on a cadre basis, consisting of an increased establishment of officers and N.C.O's and a full peace establishment of specialists. Relations with the Regular (Continental) Army would be far closer than at present.

In the place of the present annual camp training, Territorial cadre units would be attached to Regular formations for a fortnightly annual training period. Promotion of Territorial officers would depend on successful attachments to Regular units. A proportion of the more technical personnel required for Territorial units on embodiment would, as mechanization developed, be provided by supplementary reservists. Territorial personnel would receive higher pay than is now the case, owing to the economies effected by a drastic reduction in the number of privates on the establishment. More money would also be available for attachments and the provision of up-to-date equipment for specialists. Consequently, training, when not in the form of attachment to Regular units would consist of specialist training and theoretical tactical training of officers and N.C.O's and weapon training. By this means leaders and trainers would be produced capable on embodiment of training recruits enlisted to bring units of the Territorial Army to war establishment.

VI—How Re-organization might be carried out.

The most difficult problem in any scheme involving radical re-organization of a military force is: How is the re-organization to be carried out. It is claimed that the organization now suggested, although revolutionary, could be carried out with the minimum of disorganization. The framework already exists.

The four Divisions of the Expeditionary Force would remain and the personnel would be invited to re-enlist on the special enlistment terms for the Continental Army. Simultaneously, each infantry brigade would be reduced to three battalions, the fourth battalion being transferred to the Colonial Army. There would then be twelve to fourteen battalions in the Colonial Army to tide over the interim period after which these would be rapidly reduced to eight, with units from the other arms in proportion. One centralized depot in each command would receive all the recruits from that command and train in two wings: a Colonial wing for overseas units and Colonial units at home, and a Continental wing for the four divisions of the Continental Army. All Army troops, being part of the Continental Army would require no immediate re-organization.

No great administrative problems need arise with regard to the proposed re-organization of the Territorial Army. But there exists one outstanding difficulty: Is it possible to retain the identity of regiments on the Territorial basis under the centralized depot system, or will this innovation, together with the process of disbanding certain infantry battalions, and substituting units of armoured fighting vehicles for others, destroy the traditions of regiments, built up through the whole course of our military history and generally admitted to be the backbone of the British Army?

It is difficult to imagine any far-reaching scheme for re-organization which is not open to this criticizm. Whether re-organization takes place on a considerable scale or further improvisations are adopted, it is difficult for instance to see how the placing of infantry officers on a general list is to be avoided. This is a subject of which space forbids discussion. But let this much be said: the actual substitution of mechanized units for cavalry and infantry, though from the regimental point of view a tragedy, need not destroy tradition; moreover, a principle of this or any scheme must be that regiments or battalions are re-organized and re-equipped *as* battalions and regiments retaining their individual identity and traditions.

No scheme of re-organization involving additional expenditure can be considered practical. It is not proposed to produce statistics, but it may, for practical purposes, be assumed that *men* are the expensive item in a highly paid professional army. Food, clothing, quarters, education, medical, dental and spiritual attention, pensions, the multifarious liabilities for expense which are incurred in peace and war with regard to men and their dependents, fuel, light, recruitment and pay count for little. An estimate of the total cost of an infantry private for one year under these headings would be astonishing. If it be feasible to reduce the numbers of these men, by 25 to 50 per cent., while retaining, or even increasing, the striking power of the Army by substituting armoured fighting vehicles for platoons and sections, it is difficult to imagine that there can arise any additional expenditure. Indeed, there should be an actual saving out of which to find money for the heavier and more expensive armoured fighting vehicles.

Lastly, no one doubts in this mechanical age that mechanical vehicles will grow cheaper as well as more efficient. On the other hand, personnel, as the current standard of living rises, will become steadily dearer.

VII.—The Foreign Reply to a British Mechanized Army.

What answer can a European Power make to our "Continental Army," the highly mechanized force capable of moving a hundred miles in a day and fighting a decisive battle at the end of its march?

The armies of the European Great Powers, with certain exceptions, are raised by conscription, conscripts being paid a few pence a day and their feeding and quartering being on the cheapest possible scale. It follows that no Continental Power could possibly change from a man-power to a machine-power army without incurring enormous additional expense. They have nothing to save by substituting expensive machines for men that cost next to nothing. Neither can they fall back on a small highly mobile mechanized force. Most Continental Powers have long and vulnerable frontiers to guard. Fortresses are obsolete. However mobile its mechanized force, no Continental Government would care to risk an initial invasion of its own territory. Now this is the danger which the abolition of a traditional army of masses might bring about.

Our late enemies are exceptions to this rule—as regards conscription; on the other hand they are prohibited from organizing a mechanical force by the provisions of the Peace Treaties.

It appears therefore that we are the only Power in Europe and, with the exception of the United States of America, the only Power in the world that can organize a mechanized Expeditionary Force with the characteristics previously described, without enormous and prohibitive additional expenditure. This is still an advantage that accrues from sea power, however much impaired this may be.

VIII.—Conclusion.

Our present organization, designed many years ago, no longer meets the changed conditions and circumstances of to-day. The most favourable lines on which our organization and equipment should develop, i.e., mechanization, clash with the requirements of India and the overseas garrisons. Any attempt to effect a compromise in our military requirements can only result in as highly involved and complicated a system of organization and training as exists at present.

A tentative organization has been put forward which, while doubtless giving rise to new problems, appears to offer outstanding advantages. It would clarify the present obscure situation as regards training and organization, while permitting the organization of the most highly mobile and, for its size, powerful, striking force in Europe or in Asia.

Such a force might well prove a decisive factor in the event of our being called upon to intervene in a dispute in Europe. In Asia, its mobility would enable it to avoid difficult topographical obstacles, and to operate against the flanks and rear of a hostile force. Working on these lines it might prove the solution to the problem of the defence of India.

RECIPIENTS OF THE ROYAL UNITED SERVICE INSTITUTION GOLD MEDAL

(With rank of Officers at the date of the Essay).

1874. Captain H. W. L. Hime, R.A.
1875. Commander G. H. U. Noel, R.N.
1876. Lieutenant J. F. G. Ross of Bladensburg, Coldstream Guards.
1877. Captain Philip H. Colomb, R.N.
1878. Major T. Fraser, R.E.
Captain E. Clayton, R.A.
1879. Captain The Hon. E. R. Fremantle, C.B., C.M.G., A.D.C., R.N.
1880. Captain J. K. Trotter, R.A.
1881. Captain L. Brine, R.N.
1882. No Medal awarded.
1883. Captain C. Johnstone, R.N.
1884. Captain G. T. Browne, Northamptonshire Regiment.
1885. Lieutenant F. C. D. Sturdee, R.N.
1886. Captain C. E. Callwell, R.A.
1887. No Medal awarded.
1888. Captain J. F. Daniell, R.M.L.I.
1889. Captain H. F. Cleveland, R.N.
1890. Captain G. E. Benson, R.A.
1891. Captain R. W. Craigie, R.N.
1892. Lieutenant-Colonel J. Farquharson, C.B., R.E.
1893. Commander F. C. D. Sturdee, R.N.
1894. Major F. B. Elmslie, R.A.
1895. Commander J. Honner, R.N.
1896. Captain G. F. Ellison, Queen's Royal West Surrey Regiment.
1897. Commander G. A. Ballard, R.N.
1898. Captain W. B. Brown, R.E.
1899. Commander G. A. Ballard, R.N.
1900. No Medal awarded.
1901. Lieutenant L. H. Hordern, R.N.
1902. Major A. H. Terry, A.S.C.
1903. Lieutenant A. C. Dewar, R.N.
1904. Lieut.-Colonel C. E. D. Telfer-Smollett, 3rd Bn. South Staff. Regt.
1905. Major W. C. Bridge, South Staffordshire Regiment, *p.s.c.*
1906. Lieutenant B. E. Domvile, R.N.
1907. Lieut.-Colonel A. F. Mockler-Ferryman, Reserve of Officers.
1908. Major A. B. N. Churchill, R.G.A.
1909. No Medal awarded.
1910. Captain P. W. Game, R.H.A.
1911. Captain H. T. Russell, late R.G.A.
1912. Commander K. G. B. Dewar, R.N.
1913. Major A. Lawson, 2nd Dragoons.
1914-15-16-17. No Medals awarded.
1918. Lieutenant W. S. R. King-Hall, R.N.
1919. Colonel J. F. C. Fuller, D.S.O., Oxford & Bucks. L.I.
1920. No Medal awarded.
1921. Flight-Lieutenant C. J. Mackay, M.C., D.F.C., R.A.F.
1922. Major R. Chenevix-Trench, O.B.E. M.C., Royal Corps of Signals.
1923. Captain A. H. Norman, C.M.G., R.N.
1924. Major L. I. Cowper, O.B.E., King's Own Royal Regiment.
1925. Lieut.-Colonel J. C. Dundas, D.S.O., Royal Tank Corps.
1926. No Medal awarded.
1927. Colonel H. Rowan-Robinson, C.M.G. D.S.O., R.A.

MECHANIZATION AND MILITARY POLICY

By Lieutenant W. Moore (Retd.)

OUR military policy of to-day regarding war against a first-class power is the same as it was in 1914. A highly efficient but numerically weak regular army is intended to be sent out to bear the first shock of war while the nation is preparing the forces which, ultimately, will fight the campaign. The disadvantages of such a scheme are obvious. But, if the mechanization of the world's armies is to become as general as has been suggested by Major Dening in the November number of the Journal,[1] these disadvantages will be seriously aggravated.

Our original Expeditionary Force was mainly enabled to do what it did in 1914 by the high efficiency of the junior officers and of the rank and file as compared with the corresponding standard current in continental armies. This state of affairs was natural since the British soldier had done on an average some six years with the colours before passing to the reserve, while his officers and the majority of his N.C.O's. were men who had made soldiering their profession. If the human be replaced by the mechanical fighting unit that difference in efficiency, whether between material or personnel, ceases to be of such great importance; and the matter tends to become one of gross weight of armament. As Major Dening says, "an army with many tanks of not quite the latest pattern will be far superior to an army possessing only a few tanks of the latest design."

A mechanized army is cheaper per unit of fighting power than one composed only of human and animal elements. For the sake of simplicity, let us assume that difference to be 33 per cent. This being so, we may further assume that many European nations will say: "We will mechanize, and for the same amount of money as we are spending at present we will obtain an increase of fifty per cent. in fighting power." The British taxpayer, however, is likely to say: "We will mechanize, and so get the same fighting power as at present at two-thirds the cost." Should this surmise be correct, we may see another Expeditionary Force leaving England only to be outnumbered more hopelessly than was our little Army of 1914—without being able to derive a like advantage from the superior efficiency of its long-service professional soldiers.

With armies wholly or largely mechanized we can never repeat our action of 1914. From the very outset we shall have to place in the field

[1] "The Obstacles in the Way of Mechanization of the Army," by Brevet-Major B. C. Dening, M.C., R.E. R.U.S.I. Journal," November, 1927.

a weight of armament approximately, at least, equal to that of our enemies.

To turn from the destructive to the constructive. If it be necessary to mechanize the bulk of that part of the Regular Army which is kept for war on the European Continent, it is equally necessary to mechanize the bulk of the Territorial Army. That Army does not exist for small wars. Nor, except in the case of a few artillery and engineer units, is it organized for home or aerial defence. It exists to form the basis of the field army for use in a national war. Despite the many unavoidable difficulties in regard to training with which the Territorial Army is faced, mechanization would give it a greater chance to attain to the standard of efficiency required for such a war.

Let us see how this can be done. A large proportion of our civil population is now engaged in driving or maintaining mechanically propelled vehicles. Apart from professional motor drivers or mechanics, even the middle-class man can and does keep a car. Disregarding the lessened importance of comparative efficiency in the personnel of the opposing forces, it should not be a difficult matter to train such men to drive and manœuvre military mechanical vehicles under most conceivable service conditions. Skilled artificers could be recruited from civilians employed as such.

The next step would be training in gunnery (including use of the machine gun), an easier thing to teach in a drill hall or barrack square than many of the subjects which the Territorial soldier now has to learn. Even in South Africa, where the British Army suffered from too much barrack-square work, its evil effects hardly affected our artillery.

Should these suppositions be fulfilled, there remains no reason why our Territorial Army should not, in the course of a few years, be reorganized on mechanized basis. In fact there is every reason why this reconstruction should be faced and carried through.

When this very necessary reform has been even partially completed, we shall be faced with our next and greater problem, namely, to use our mechanized Territorial Army to support our mechanized Regular Army on the outbreak of war, since only by some such system does it seem possible to take the field on equal terms. How is it to be done? There seems only one way to accomplish this. Let us assume that in any future "mechanized" war to each Regular unit we can affiliate three Territorial units similarly organized. On mobilisation one Regular unit —say the battalion—can be expanded into a four-battalion brigade by making each company the nucleus of a battalion, each platoon the

nucleus of a company, and infiltrating into each new battalion three companies from one of the affiliated Territorial units. The fourth company of each Territorial battalion would then become a training unit or the nucleus of a unit. The Commander of the Regular unit would command the newly formed brigade; the three new battalions would be commanded by the Territorial C.O's. and the fourth by the second in command or senior company commander of the old Regular battalion.

The great objection against this scheme is the pledge given to the Territorial Army that it will never again be broken up and drafted to Regular units. That promise was given under conditions which threaten before long to become obsolete. In addition, the abolition of the Cardwell system has been suggested, together with the division of the Regular Army into two distinct branches: one for use in Continental warfare, the other for use in certain types of small wars and lesser operations. This change is utterly opposed to present Army tradition. Yet similar radical changes were brought about by the introduction of the Cardwell system itself, and, since the war, in course of the re-organization of the Indian Army. The Territorials rightly claim to be treated as serious soldiers. If so, they must accept the disadvantages as well as the privileges arising from that status.

There is yet another point; a bold statement, maybe, but we must face facts. That pledge was given to the Territorial Army when it was being reformed after the war. At that time, the Regular Army was not looked upon with great popular favour. Contemporary literature of the period shows this by depicting generals and colonels as choleric blockheads, sergeant-majors as leather-lunged bullies. The Army at the time of the Armistice did not contain the best type of soldier; the latter, indeed, could scarcely be expected to regard the Army with favour.

The Territorials of 1914 thought differently. Regular and Territorial battalions had fought in the same brigade during the war and were proud of the connection. Why should not this comradeship be revived? The time seems to be not far distant when some such scheme will be welcomed by the Territorials, since it would enhance their own importance and place them more on a par, as regards reputation for efficiency, with the Regular. Even if only a few units were willing to accept the obligation we should then have two sections of the Territorial Army, just as Major Dening suggests we should have for our Regular forces; one section would elect to reinforce the Regular Army on outbreak of war, the other to form the cadre for further expansion. In either case the degree of dilution would be the same. Would not the former come to regard themselves, and be regarded, as a *corps d'élite*? If so, additional units would soon be clamouring for a like distinction.

MEDICAL TESTS FOR R.A.F. PILOTS

By Group-Captain M. W. Flack, C.B.E., M.B., M.A.

GENERALLY speaking, the medical examination for the Services is directed towards ascertaining that the candidate is free from any disease, abnormality or defect which will interfere with the efficient performance of his duties at home or abroad, in peace or war. In the case of the Navy and Army this examination can follow certain routine lines, which do not differ greatly from that applicable to a first class life insurance.

For the selection of personnel for flying, the case is different. In addition to the exclusion of disease, abnormalities or defects, a definite assessment has to be made of physical efficiency for flying duties, for which ordinary clinical methods are not adequate.

During the late war it was found that personnel fit for duties on the ground were often by no means suitable for duties in the air. In consequence special methods had to be devised to determine fitness for full flying duties, and to exclude candidates who were likely to be unable to learn to fly efficiently or, having learnt to fly, to withstand the effects of altitude, aerobatics, prolonged flights or the general nerve strain of combatant duties in the air.

The method employed to evolve such tests was to examine a relatively large number of pilots, chosen by the executive at the Admiralty and War Office as having rendered efficient service in the air, and to compare the results obtained with those of the same tests carried out upon pilots who had not performed so well or had definitely broken down or been pronounced inefficient.

For such tests to be workable, it was essential that they should not be too elaborate in nature, otherwise (*a*) they could not be performed by the ordinary medical officer; or (*b*) too long time was taken in their performance so that a sufficient number of candidates could not be examined daily without a considerable increase of medical staff.

It is now accepted in principle that the routine medical examination of flying personnel shall embody certain "efficiency tests," worked out on the lines mentioned above. They are also such as can be used at stations by medical officers for the periodic medical re-examination of flying personnel. By the use of an efficiency index, calculated from

the results of the tests, an opinion is easily formed as to fitness or otherwise.

It is interesting to note that officers who were not admitted by the above tests but represent, so to speak, "the survival of the fittest" as regards flying competency, continue in recent years to attain the standards tentatively set in 1917-18. The same is true in respect of the civilian pilots of great experience.

In learning to fly, a pilot must be able to perceive correctly and to perform the co-ordinated limb movements of flying satisfactorily. Of all the senses, vision plays the greatest part, and on this account a relatively high degree of visual acuity is required (6/9 D). It was found during the war that quite a number of would-be pilots, although capable of correct limb movements, could not learn to land successfully. Investigation showed that this was due to defective visual perception arising, not from a lessened visual acuity but from lack of correct visual judgment. To illustrate the importance of visual judgment in flying it may be mentioned that, with one exception, 178 officers granted permanent commissions in the years 1922-1927 possessed very good visual judgment, although they were not specially tested for such on admission, as the importance of this factor was not realized at that time. In contrast to this may be quoted the fact that 33 per cent. of over 300 pupils turned down from flying training by the executive for various causes during 1917-18 had definitely defective visual judgment, and of those who manifested this defect over 90 per cent. could not land successfully. Normal colour vision is requisite for flying.

Normal acuity of hearing is not necessary for the act of flying in itself, although it plays an important part in appreciating the correct "note" of the engine, and in the reception of wireless and verbal instruction during training. Nevertheless, the ears are thoroughly examined, not only to ensure adequate hearing, which is a sign of absence of disease likely to be aggravated by flying, but also to ensure that no abnormality exists which is likely to cause giddiness in the air

So, too, the nose, mouth and throat, are required to be healthy, not only to ensure adequate air entry, but to see that no condition exists which is likely to lead to inefficiency from the various infections which are more liable to occur in the unhealthy owing to the drying effect of the cold dry air at altitudes.

The ascertainment of power adequately to perform the co-ordinated movements of flying does not lie, strictly speaking, within the province of the medical examination, since lack of flying ability is adjudged by the executive. Recently, however, there has been devised a machine to meet this requirement. In this apparatus, the power to manipulate

the actual control column and rudder bar of an Avro training machine is tested and a written record obtained of the limb responses to certain flying movements. The machine, known as the Reid aptitude apparatus, has now been installed at various Flying Training Schools.

For physical endurance in flying duties the great requirements are general nervous stability, combined with stable nervous control of efficient respiratory and circulatory mechanisms. Generally speaking, an adequate opinion of such stability can be formed from the results of the efficiency tests, but in cases of doubt special measures can be undertaken The signs of such stability and instability are briefly synopsized below.

A steady regular sitting pulse (60-72 per minute) rising in rate on standing up by not more than 24 beats a minute and subsiding in a short time to the normal sitting rate in the very fit, or from 6-12 a minute above that rate in the averagely fit. After exercise (standing on a chair five times in fifteen seconds) the pulse will increase from the steady standing rate by not more than 24 beats a minute, and will return to the observed standing rate in under 30 seconds. Conversely, lack of stability of control and efficiency is denoted by (1) quick pulse (irregular or otherwise), (2) undue immediate increase in rate on standing from sitting, (3) markedly increased standing rate, (4) undue increase after exercise, (5) delayed rate of return to normal standing rate.

The measurement of the blood pressures also affords valuable information. In the efficient pilot the blood pressure while the heart is pumping (the systolic pressure) has been found to be about 120 m.m. to 130 m.m. of mercury pressure, and the pressure between the beats while the heart is resting (the diastolic pressure) has been measured at 75 m.m. to 80 m.m. Hg. [1]

Conversely, lack of stability of control and efficiency is characterized by:

(i) Unduly raised systolic pressure (after all efforts to abolish temporary nervousness have failed);

(ii) Diastolic pressure (*a*) above 95 m.m. Hg. (suggestive of nervous instability or some toxic cause, e.g., alcohol), (*b*) below 70 m.m. Hg. (indicative of possible predisposition to fainting).

In the efficient pilot the respiratory capacity of the lungs, as measured by asking him, after the biggest possible inspiration, to breathe out fully through a modified form of gas meter (spirometer), is found to be on the ample side when estimated according to his height, weight and chest capacity. The subject who is likely to be ineffective at altitudes is often found deficient in this respect.

[1] Hg = Mercury.

For altitude flying it is also necessary that the breathing shall not be unduly affected by the diminished oxygen pressure at high altitudes. An indication of liability to this is afforded by getting the subject to hold his breath as long as possible after the fullest expiration and fullest inspiration; the time in the fit subject is about 70 seconds. This simple test has been correlated with results otherwise obtained by careful experiments in rarefaction chambers and by rebreathing in and out of a bag in which the exhaust gases of expiration are absorbed. By these means it has been found that the breath-holding test affords valuable relative information as to whether a candidate is or is not likely to suffer distress at altitudes

For efficient breathing during flying it is important also that the pilot be able to empty his lungs in the face of the strong wind or slip stream frequently met with while flying. Subjects with feeble expiratory musculature tend to tire easily and break down on the exhaust side of the respiratory bellows. Thus it was found that the non-effective could only, with the cheeks held, blow up a column of mercury to about 60 m.m., whereas the effective could blow 110 m.m. mercury or over. Hence all candidates for flying are now expected to be able to blow a pressure of 110 m.m. of mercury or over.

Both respiratory and circulatory efficiency, as well as stability of control, are indicated by the ability to maintain a relatively steady pulse rate while supporting by blowing for approximately 50-60 seconds a column of mercury at 40 m.m. with the breath held. On the other hand, a large rise in pulse rate, e.g., from 72 per minute to 132 or 144 per minute in a much shorter time (30-40 seconds), is unsatisfactory and was found in the non-effective. Accordingly, this test is performed upon all candidates for flying duties.

As stated, however, nervous control in respect of all the bodily processes plays a great part in conferring bodily endurance. Thus undue sweating or signs of disturbance of blood control, e.g., flushing, are, equally as much as a quickened heart rate, signs of instability.

A history of undue "emotivity" as a child, or of any previous nervous illness, "shell-shock" or breakdown, is regarded as evidence of unstable nervous control with a consequent tendency to break down under the strain of flying duties. The presence of stammer, tics, persistent nail-biting or restlessness under examination is considered to be indicative of such a state.

General stability is also assessed by noting the so-called "knee jerks" when the tendon is struck below the knee cap; by getting the subject to stand with eyes shut and arms and fingers extended, but not rigidly. Also by getting him to perform the following test: The subject

stands as "at attention," but with heels and toes touching, he then flexes one knee to a right angle (care being taken that it is not rested against the supporting limb) and, having obtained his balance, shuts his eyes and endeavours to maintain the position for fifteen seconds. If necessary, three attempts to carry out this test are allowed.

Another test for general nervous control is to get the candidate to raise to shoulder level a somewhat top-heavy rod balanced on a light board and then to replace it on the table without upsetting it. Although in the knee-jerk a very brisk jump of the leg is not in itself a bad sign, it is of considerable significance when combined with poor performance of the "self-balancing" and "rod" tests. Both these latter tests are performed with ease in subjects possessing good higher control, and satisfactory performance has been found in efficient pilots. On the other hand, poor performance has been noted in association with states of exhaustion, flying stress, insomnia and other "nervous" conditions in an early stage of development.

In the assessment of a candidate's efficiency for flying duties care has to be taken to differentiate as far as possible between states producing temporary lack of nervous stability and control and those in which such lack is of a more permanent nature. As a guide to the assessment of fitness an efficiency index is worked out, based upon the examination of results obtained in fit and unfit subjects. This index is arrived at by deducting marks for non-effectiveness.

Broadly speaking, therefore, in forming his final conclusion, the assessor has to satisfy himself whether (1) the subject presents such physiological characteristics that he is likely to become an efficient pilot, and (2) he has no history or present sign of any defect or disease likely to render him unfit for such duty.

In certain cases, doubt will arise as to whether the subject:

(1) Possesses the physical attributes for the efficient handling of aircraft under all conditions;

(2) Has adequate physical and nervous stamina to render prolonged and efficient service in peace and war.

In respect of efficient handling of aircraft it may sometimes be necessary to ensure that adequate neuro-muscular control or strength of limb exists by testing the candidate upon the Reid apparatus already mentioned. The test also affords valuable information as to "stability of control."

In certain countries "psychomotor responses" are often tested in detail, as for example, asking a candidate to press or release a key when he sees a light (visual reflex) or hears a noise (auditory reflex) or fee

a touch (tactile reflex). But the employment on one occasion of such special tests, does not afford altogether valuable or reliable information. Sports and games, in themselves, represent a test of quickness of perception and of muscular co-ordination carried out on repeated occasions under more congenial circumstances than those of an examination room. Therefore, considerable attention is paid to the all-round aptitude of the subject for games and sports, it being adjudged that a man who has manifested such athletic prowess is likely to be possessed of good visual judgment and muscular co-ordination, as well as of considerable physical endurance and the spirit of " playing the game " which makes for good morale.

Apart from straight flying, in some instances doubt may exist as to whether the subject is likely to be able to perform aerobatics. Here the effects of rotary movement afford guidance in any case of doubt, particularly in subjects giving a history of liability to giddiness, nausea, vertigo or fainting. The subject is seated in the rotating chair and the nature of the test explained to him. The pulse rate and arterial pressures are taken just before the spin. Immediately after the spin (10 rotations in 20 seconds), these are again observed and the results noted, as well as, in the special cases, the effect upon the ocular muscle balance.

The main results of the test may be summarised as follows :

(1) In fit pilots, particularly those accomplished in aerobatics, rotation produces but little effect upon the pulse rate or arterial pressures ;

(2) In cases subject to vertigo, nausea or vomiting, rotation produces a marked rise in pulse rate and systolic and diastolic pressures ;

(3) In subject liable to fainting, rotation produces a characteristic fall in diastolic pressure ;

(4) In highly-strung subjects, liable to develop an anxiety neurosis, there is a marked anticipatory rise of pulse rate and systolic blood pressure prior to rotation, which may or may not be further affected by rotation.

Finally, although a satisfactory response to the efficiency tests may be taken to indicate fitness to withstand the effects of high altitudes, certain " border-line " cases may have to be specially tested by the " re-breathing test," known as the " bag method " already referred to.

THE GERMAN OFFENSIVES OF 1918

WERE THEY FORESEEN?

THE innermost thoughts of the German Higher Command with regard to their offensives of 1918 have been revealed by General Von Kuhl.[1] For the first time a convincing picture is offered of the intentions of the German General Staff at this period. In view of the importance of the events described, it may prove of value to study how far the Allied, and particularly the British, General Staffs were aware of the German intentions, on what the Allied conclusions were based and how far the Allied Staffs were able to affect events by their advice. Further, since it would seem highly likely that, under modern conditions of war, occasions for breaking a stabilised front will recur, it is worth investigating the cause of the German failure and to surmise what, with different handling, might have been the results.

The Main German Offensive, 21st March, 1918.—From the close of 1917 it became clear that the early part of 1918 would see a determined effort on the part of the Germans on the Western front to decide the war before the intervention of the American forces. The problem was not whether there would be an attack, but rather where the main blow or blows were to be delivered.

The German Army possessed but a handful of tanks. In an offensive, therefore, it must depend for success upon initially intense artillery preparation. To mount a very large bombardment certain steps could not be avoided. The extra artillery to be used had to come into position (though this could be left until tolerably late in the programme). The necessary ammunition had to be accumulated (this was the serious difficulty, for the supply required for a few hours intense bombardment often took weeks to collect). Further, apart from the requirements of the bombardment, much preparatory work was necessary before a normal front could be used by a greatly abnormal number of troops for battle purposes. Accommodation, water supply, hospitals, depots of all kinds, roads, tracks, light railways and aerodromes, to mention only a few of the rear organizations, required to be increased. Given a front upon which conditions had been quiet for a long period, the preparatory

[1] See the R.U.S.I. JOURNAL, February, 1928: "The German Offensives of 1918."

steps mentioned above—even with the air photographic apparatus of 1918—could not be undertaken without great risk of detection by aircraft.

The German General Staff was faced, therefore, with certain initial disadvantages, which had in fact faced the Allies throughout the previous three years. But the Germans had two compensating advantages, one of which was very apparent, at least to the British Staff watching for the smallest indications, while the other was more a matter of chance. The first of these was the fact that in fighting, defensively, the battles of 1917, the Germans had built up many of the rear organizations needed for an offensive battle on the Ypres, Arras, Aisne and Verdun fronts. On these comparatively little work was needed to base an offensive, and preparations could be made without great loss of time and without attracting much attention. The Allied Staffs were thus faced with these potential danger areas, which agents' reports, either inspired or in all innocence, alleged, each in turn, to be active.

The second advantage which the Germans possessed was that offered by the vagaries of the weather in winter. The Allied Intelligence was greatly dependent upon the photographs supplied by their Air Force, but these could only answer definite questions if frequently taken of the same areas. At a most critical time, for roughly a month prior to the German attack of 21st March, it proved impossible to obtain *any* photographs on account of clouds, and for that period the Allied Staffs were in the dark.

From the summary of General Von Kuhl's narrative it does not appear that great consideration was given by Ludendorff to this essential question of concealment of rear organizations in choosing the scene of attack, though many other precautions against the discovery of the plan were taken.

To revert to the problem as seen from British G.H.Q. in February and March, 1918, there were the already-mentioned danger zones of Ypres, Arras, the Aisne and Verdun to be watched. Reports were also received from at least four of the British Armies and from French G.H.Q. that significant preparations were noticeable upon their various fronts. It finally became necessary to decide upon the location of the British reserve divisions, for if they were much out of place at the moment of impact there might have been no chance of re-establishing the front. Fortunately, before the month of cloud settled down upon the trenches enough air intelligence had been obtained to enable the late Brigadier-General Cox,[1] the head of the Intelligence General Staff

[1] Brigadier-General E. W. Cox, D.S.O., R.E., who gave this momentous opinion in Feb., 1918, was drowned some months later in France.

at G.H.Q., to say with some assurance that the German main effort was to be expected *between Arras and St. Quentin*. Though various pieces of intelligence contributed to this verdict, the deciding evidence was the appearance on this front of unmistakable and immense ammunition dumps, visible in spite of camouflage upon air photographs.

Examining the decisions upon the German side it is remarkable how accurate was the British forecast of the coming attack, although it did not contemplate attack quite far enough south of St. Quentin. For this oversight there was a definite reason. Late in the winter of 1917-1918, at the urgent request of our Allies, the British Army took over a new sector of French front south of St. Quentin. A hand-over of front from an Intelligence point of view is deplorable at any time, even between formations of the same army, but a change from the French to the British, coupled with the bad photographic weather, resulted in the front south of St. Quentin escaping that continual close study which was so essential at such a period. Hence in this sector the Germans effected a surprise. But when the length of the front from Switzerland to the sea, some hundreds of miles, is considered, it should go down to history how successful British G.H.Q. were in locating perhaps two-thirds of the front selected for the first and greatest German assault. The action taken as a result of the British conclusions was of immense importance, and perhaps saved the war. On the front seen to be threatened, held in the main by the Third British Army, reserves were placed. The Corps of this Army were given reasonably short fronts, and were allotted reserve divisions in close support. The Corps of the unfortunate Fifth Army, on the other hand, particularly north and south of St. Quentin, were asked to hold wide fronts with practically no reserves. When the German attack came, as Von Kuhl discloses, its main strength came upon the stiffened part of the British front and collapsed, suffering losses which obviously crippled Ludendorff's subsequent offensives. Only the German flank guard attack north and south of St. Quentin, aided by a fog, really succeeded, and this appears to have surprised the Germans as much as it did the Allies, and thrown their plans out of gear.

It is easy to be wise after the event. But none the less it is perhaps permissible to-day to consider what might have happened had the Germans had better intelligence of the Birtish moves, taken advantage a little more of the difficulties of the Allied Intelligence Services, and launched their great strength at some spot other than that at which the British spear point was ready to impale it.

The Second Offensive, Lys, 9th April, 1918.—Passing on to the next offensive, on the Lys; for months it had been apparent to the British

that here a possible alternative attack was being mounted. This knowledge was again based upon the German activities as revealed mainly by air photographs. According to Von Kuhl's narrative, this attack, which had long been contemplated, was decided upon on about April 1st, nine days before it was delivered. But final intimation of the coming blow here was not definitely obtained by the British from a prisoner until some forty-eight hours before the blow fell. Some hurried movements of reserves were ordered, but the warning was not sufficient to complete these. Fortunately the scale of attack was small, only seventeen divisions being initially thrown in as compared to sixty-three on 21st March. The first break through thus could not be adequately exploited, and the Allies succeeded in stabilising the front. On this occasion the verdict is probably that the German Command succeeded partially in deceiving the British Command.

The Third Offensive, the Aisne, 27th May, 1918.—The next attack of May, on the Aisne, offers more food for thought. The front attacked was held by British and French divisions sent from the fighting in the north to recuperate, which were consequently in a weak state. The Allied Intelligence Service watching this front was partly French and partly British, and again there had been an international hand-over some weeks prior to the attack. The front was one of those already mentioned as fully developed for battle purposes owing to the struggles of 1917. The Allies thus were temporarily as weak here from the Intelligence point of view as from the point of view of fighting strengths, while the Germans had in an already prepared front a useful cloak for concentration. Von Kuhl states that thirty German divisions were concentrated between 17th April and 27th May. Of this great blow the Allied Intelligence had no inkling until some thirty-six hours before the attack, when prisoners divulged the plan. A reserve French division was hastily brought up, but little could be done in the time. The German attack broke the front for forty miles to a depth of over twenty miles. But Von Kuhl reveals that this great success was so unexpected as finally to have become "fatal" to the eventual success of the German Army.

This case is perhaps the most interesting of the series. The Allies on this front were momentarily paralysed from the Intelligence point of view, and too occupied elsewhere to maintain adequate reserves. They were completely caught out and yet the Germans, having made a more devastating breach in the defence than occurred at any other period of the war, were incapable of exploiting their success. That this was so can only be ascribed to the fact that the extent of the success, as south of St. Quentin on 21st March, surprised no one so much as

the Germans themselves. It would seem again that their knowledge of the state of the Allies was wanting, for they were scheming for a break through in Flanders, where the Allies had already been placed upon their guard, when all the conditions of a first-class victory were available on the Aisne. If here the Allied General Staff were completely deceived, it now appears that the Germans were almost equally out of touch with realities.

The Fourth and Fifth Offensives, Matz, 9th June; Rheims, 15th July.—In both these cases the Germans had lost the advantage of utilising old prepared fronts for mounting their attacks. In both comparatively virgin ground was concerned. Partly for this reason, and partly because the French had had the opportunity to obtain adequate intelligence from prisoners and air photographs, neither attack came as a surprise. In both areas French reserves were placed in position to prevent any great success. On the Rheims front Gouraud's withdrawal in face of the attack has become famous. The Germans here showed clearly that they were not aware of the degree to which their plans were capable of investigation by the Allied General Staffs.

In addition there was a sixth offensive, referred to by Von Kuhl, staged for Flanders for July, of which the British Army had full knowledge. But for several reasons this attack was not delivered. In this case the intelligence came from a number of sources.

Conclusion.—Regarding the German offensives of 1918 as a whole, we may conclude then that the German attacks of 21st March, 9th June and 15th July had been wholly foreseen by the Allies, that of 9th April partially escaped their attention, while on 27th May the Germans effected a complete strategic surprise. The honours are thus greatly on the side of the Allies. As far as the British General Staff is concerned, may it be hoped that their success in meeting the greatest and by far the most dangerous of these attacks, that on 21st March, may be accorded due, if belated, recognition?

TEN YEARS AGO

THE PASSING OF THE GREAT CRISIS

The summer of 1918 *saw the gradual delivery of Great Britain and, with her, of the Allies from the menace of the German submarine war on merchant shipping. It is, perhaps, scarcely necessary to remind our readers that this menace constituted the greatest crisis of the war and the gravest peril which has ever threatened the Empire. The following vivid tribute to the men who did so much to save the situation is from the pen of Mr. Cecil Roberts, who was a naval correspondent with the fleet as well as accredited correspondent with the British Army on the Western Front and with the Royal Air Force at various stages of the war. It first appeared as a letter in* The Times, *and is reproduced by permission of the Editor of that journal.*—EDITOR.

AN article "Ten Years Ago" in *The Times* very rightly calls attention to that great hour in the submarine war when the victory of the Allies was assured by the recognition, on the part of the German naval authorities, that the U-boat campaign had been defeated by British Admiralty measures, and above all by "British tenacity and knowledge of sea warfare."

The institution of the convoy service saved the merchant fleet, but the difficulties of this service and the heroism and tenacity of those employed in it can never be adequately acknowledged. The difficulties were mechanical and mental, as well as naval. Taking a convoy to sea called for precise rules and adequate rehearsals. The ships were as diversified as the crews. Old ships and new ones, with high hulls and low hulls, ships of 7 knots up to 12, with crews from 10 to 50, with masts of all heights and guns of all sizes, they had all to be reduced to a common denominator of seamanship, for the dead level speed was determined by the maximum of the slowest boat, a fact, entailing some jeopardy to the swift, that did not make her skipper popular. Again and again the poor little skipper, throughout the instructional lecture preparatory to sailing, would pitifully remind the senior naval officer that, at her best, his ship would only do 7 knots, and he wasn't sure of that. The result was that on the early morning of the great adventure the big boilers were almost bursting with keeping under their steam, and the small ones with getting it up.

Gallant fellows, they were not much to look at as they sat there, in the little schoolhouse above Milford Haven, cramming themselves into the rows of small desks. No one could guess the degree of romance and boldness in those rough exteriors. They wore bowler hats and soft collars, lounge suits and creased ties, with scarcely a uniform amongst them. They might have been railwaymen at a union meeting in their Sunday clothes.

The officer deputed to the task of instruction had, and needed, a gift for languages, and in moments of linguistic desperation his gift for one particular international language, understood by those skippers of all nationalities, was well displayed. His pupils came from British, French, Italian, Greek, Russian and Brazilian ships, with crews gathered from the ends of the earth. And it was this heterodox, polyglot fleet which had to be marshalled and made to sail together with absolute precision of position and speed.

The naval Commodore leads captains who know what he wants, who command crews that obey, who understand signals received. But the poor merchant skipper commands an old hulk that should have been scrapped long ago, with a scratch crew, with engines credited with perhaps 12 knots at Lloyd's but only capable of 8 in practice. And other difficulties too—a newly recruited gunner or signalman. The latter, six months before, was perhaps measuring cloth in a draper's shop; it is now his business to wag it systematically at the end of a stick, but he is very nervous. Things are waiting for them outside the harbour, the message from the Commodore's ship comes too quick, and the tense skipper gets a very jumbled version. As for the gunner, he too is ambitious and nervous. At the slightest suspicion of anything queer he will want to begin shooting. He will do his best, but in the hottest moment of combat he is not helped by an excited foreign skipper bawling at him from the bridge to put it hot and strong into that adjectival U-boat.

The wise S.N.O. knows all these traits. He has got the ships into formation, big and little, six or eight abreast. At his signal they have weighed anchor, turned into position, maintaining uniformity, narrowed in to pass the harbour mouth, deployed again, and, like nervous recruits harried by a sergeant, moved seaward to the unknown, led by the Commodore, brought up in the rear by the nippy destroyer Somewhere off the Lizard they split, one convoy southern bound, one westward. The S.N.O., back in harbour, with his brood gone, wipes his brow. His last message was a blessing.

There were mistakes, of course. A ship with a cargo of flour and steel rods from America is destined for Liverpool and Cardiff. The flour is

at the bottom of the hold, the rods on top. She is convoyed into Liverpool to find that her flour is to be unloaded there, her steel at Cardiff. Much language on the part of the skipper does not change things. The port officer is adamant. So she sails again to get rid of her steel at Cardiff and to return with her flour to Liverpool. On the coastwise route she is torpedoed; both cargoes and the ship are lost.

But, despite incidents, it was a miraculous work. In all those four years of grave peril no merchant ship ever failed to sail out of a British port for want of a crew. Men who had been torpedoed and mined repeatedly only became more determined to go on. They pretended it was for a few shillings a day and doubtful food. They died without a mark over their graves or their names in a memorial list, not all of them white men in colour, but all of them white men in courage.

Once a week in a certain room in Whitehall there came a weekly list of tonnage sunk. It was plotted on a graph, where the "losses" line mounted and mounted month by month, and the "reserve" tonnage line fell and fell. Then another line began to rise, connected with the shipyards of Britain, and on a wonderful May morning the "losses" line dipped towards the rising new tonnage, and the anxious watchers knew the situation was saved.

There were strange boats pressed into that service, strange stories told, but humour and courage never ran out. There was one old American cruiser with the longest funnel that surely ever crossed the Atlantic. Her skipper indignantly denied that the Pilgrim Fathers had sailed in it. And that funnel had its uses. "If we get torpedoed we can lower it and walk home dry," he observed, in the face of our mirth.

Such was the spirit of the convoy service. Its reward was long delayed, but it came, on 26th June, 1918, via the mouth of Herr von Kuhlmann. Its anniversary might well be the memorial day of the nameless, heterogeneous, heroic crew that went down to the sea in ships that our life lines might not be severed.

CHEMICAL WARFARE

By Major Victor Lefebure, O.B.E.

On Wednesday, 8th February, 1928, at 3 p.m.

General Sir Noel Birch, G.B.E., K.C.B., K.C.M.G., in the Chair.

The Chairman introduced the Lecturer, stating that his experience in chemical warfare was probably unique, since he joined the Special Brigade in 1915, and all through the war was concerned with gas, also adding that his book, "The Riddle of the Rhine," had by now acquired almost a world-wide reputation.

LECTURE.

THIS contribution to the question of chemical warfare is likely to be of most value if I deal with the subject from the particular point of view which I have been privileged to observe, which is roughly that of a chemist closely in touch with every aspect of field and home development during several years of war, also having personal experience of most of the actual activities concerned, ranging from gas discharge, organization at the front, with the different allies, to the home activities of research and manufacture. It was suggested that I should concentrate on the possibilities of the future, but there is a danger there of allowing imagination to submerge reason. I would therefore like to start from first principles, and by endeavouring to extract any broad generalizations from war experience to lead up to a discussion of the future position and possibilities which would thus emerge as more or less rational conclusions. The subject has been so much exploited by sensationalists that I hesitate to add to their number.

Let me briefly explain what I desire to convey by the term "chemical warfare." Chemistry in science and industry has contributed towards the operation of war for centuries. First, its contribution was limited to the manufacture of standard armament and for the treatment of casualties through the current medical practice of the period. Later, it gave more specific assistance in the development and application of propellants. Still later, explosives became part and parcel of the shell

itself, but even at that stage the chemical was not in the main the actual casualty producer, for although in the case of shrapnel and high explosive casualties are produced by the pressure and toxic effects of gases developed in the projectile explosion, yet the main casualty producer is metal in its impact on man. Therefore, although it was true to state that until 1914 modern war in its operation was absolutely dependent on chemistry, it is equally true to state that up to that time, with very few minor exceptions, chemistry had not developed specific casualty producers, i.e., a specific chemical weapon.

War Chemistry prior to 1914.

Prior to the advent of this weapon the idea underlying casualty producers of all types was the incidence of mechanical force upon the physical structure of the human organism, so as to destroy its activity and efficiency for a sufficiently long period, and if possible for ever. Forces at the disposal of the earliest weapons were very small, and development over centuries has been mainly directed towards increasing such forces in propellant and projectile, so that to-day the energy consumed in producing a casualty by H.E. must be many thousands of times the quantity involved in penetrating a man by the mediæval arrow. Part of this gain of energy available in war for casualty production is due to the discovery and choice of new chemical compounds, the well-known explosives whose molecules possess peculiar properties of quickly developing vast quantities of energy. But, with due apologies to the extraordinary efficiency of modern artillery, the forces so harnessed are quite blind, a fact to which many of us will gladly bear testimony in remembering the countless times in which H.E. and shrapnel burst near but harmlessly.

War prior to 1914 was therefore clearly chemical in this and a variety of other ways, but the advent of the so-called poison gases introduced such entirely new features, so far removed in type from other casualty-producers, and calculated to impose such changes in the operation of war, that the new term chemical warfare logically arose and has remained. So far as my own knowledge and recollection goes, it was first admitted to the official vocabulary in France, where the term, *La guerre chimique*, was in current use on Staffs and Munitions Councils long before we emerged from the barbarous condition of relegating chemical warfare to a dark corner of trench warfare organization, and were still groping for a system and a name.

It is my opinion from observation that the growth and efficiency of any branch of war activity is largely governed and defined by its position in the hierarchy of military organization. Judged by such a standard, the French were the first to appreciate the importance of

chemical warfare amongst the allies, and allowing for the late entry into the war of America, that country was even quicker in appreciating the point and has remained so. By this, I do not suggest any comparison in the volume of effort made, because that was very largely governed by facilities available, such as chemical personnel, means of production, and natural wealth.

What are the basic considerations which have been responsible for elevating these new casualty producers to the rank of a new type of warfare?

To begin with, we have a new type of casualty. Instead of the direct mechanical destruction of some part or the whole of the human machine by the application of great force, chemical warfare makes a relatively quiet, gentle but insidious attack upon some vital function. The attack is much more specific but much less costly in energy consumption at the point or surface of contact. Speaking relatively, it is a case of hit or miss with the explosive, both in space and time, whereas the true chemical warfare agent arrives near to, and then seeks out its victims. In the case of the persistent chemicals, it even waits long periods of time for new victims to enter its range of effective action. These characteristics incidentally ultimately govern the nature of chemical warfare organization in offence and defence, entirely in the field and largely at home.

Consider the case of phosgene, which can incapacitate a man in a few seconds in a concentration of one in one hundred thousand, and cause lung injury in a few minutes at one in fifty thousand. In such cases the effective weight of chemical might easily be less than one hundredth of an ounce. Some of the lachrymators and sternutators, such as brom-acetone and the chlor-arsines, produce their effects with far smaller contacting quantities. Concentrations such as one in five million produce a valuable measure of incapcaity. The quantity of lachrymator contacting with the eye, or of diphenylchlorarsine engaging the membranes of the upper respiratory channels at such a concentration and in a few seconds (sufficient for the purpose), is so minute as to leave all other weapons far behind when graded according to quantities consumed per casualty. Naturally the crude methods of conveying the chemical to the casualty do not allow the realisation of this great efficiency, but I will refer to this later.

Were such agents available prior to 1914, and if so, why were they not employed? Most of the compounds employed in the war were known to chemistry prior to 1914, and their harmful properties were recorded. But there are reasons other than respect for International Law and national policy why the incidence of these chemicals was so retarded.

In the first place there was the question of production. One could name a number of chemicals which were known and produced in small quantities in laboratories many years, even fifty years, before practicable methods arose in industry for bulk production. The processes of manufacturing chemistry have evolved under the stress of commercial need, and have, therefore, a bias in that direction. When phosgene was first discovered at the beginning of the nineteenth century, the commercial uses for it were so small that no serious attempt was made to manufacture it for many years, whereas in the case of a substance like indigo the realisation of its nature, properties and uses was valued at much shorter notice by the expenditure of hundreds of thousands of pounds on methods and plant to produce. It is a fair generalization that on all the chief poison gases, say chlorine, the lachrymators, mustard gas, and the arsenic compounds, practical commercial processes had only emerged, or were emerging, at the beginning of this century, and then because in some cases the actual compound, and in other cases closely allied compounds, had found a use, and therefore a production stimulus in industry.

It is quite probable, however, that if the great importance of these compounds for war had been realised by the nations, their production would have been viewed with the same kind of urgency which is associated with commercial chemicals, and might have led to the same type of result, but there was no real liaison between science and war in those times. Either the scientist, knowing the properties of his materials would have had to grasp their military bearing and raise the point with the soldier, or conversely the latter would have had to be watching scientific progress very closely, and have thus realised the importance of the new chemicals and taken the necessary steps to make them available. We need hardly stop to point out that military training has not produced that kind of mentality in the past, nor has science felt called upon to add to the horrors and efficiency of modern war. Another reason holds for the delayed incidence of chemical warfare, and this lies in the fact that chemical warfare development depends almost as much upon special means of projecting and applying the chemical as it does on the choice of the right chemical. No such means were available, and even in the case of artillery, there was a great deal of work to be done to make the shell suit the chemical.

Development in the Great War.

The chief feature in the early stages of chemical warfare and practically up to the end of the war, was an almost feverish activity to make available in bulk and in suitable forms of application, any adequate chemicals which science had already revealed. A general trend in

chemical type can, however, be discerned. The first stages were devoted to launching huge quantities of chlorine against the enemy, on both sides. It was the most obvious chemical to use, a sufficiently lethal type with the minimum uncertainty in production and application. And the German attack called for a reply. Research started very quickly, and quite apart from new aggressive types coming forward, systematic investigations were made on a great number of possible war chemicals already known to chemistry. It is obvious that this was the quickest method of approach to new types. It was soon realised that chlorine was a relatively crude weapon, both in the efficiency of its attack on the unprotected soldier, its rapid dispersion after discharge, and the relative ease of protection against it. Phosgene soon appeared as another acute lung irritant, at least ten times as efficient as chlorine in terms of concentration, and imposing new problems of defence on the enemy. Its rate of mortality was higher than for any other poison gas, and it remained more or less the standard lung irritant until the end of the war, although others were introduced and employed. The increasing use of such substances against which the line of defence was the gas-mask led to such improvements in the latter that it was realised that other parts of the soldier must come under attack.

As a result mustard gas came forward It is a curious thing that in the early stages the vesicant or skin attacking properties of mustard gas, which were responsible for such large numbers of casualties, were not clearly recognised as a specific effect imposing new forms of protection and finding an unprotected objective until such forms could be devised. I remember almost heated inter-allied conferences at which violent differences of opinion arose, the one side grading mustard gas and measuring its importance by comparison with acute lung irritants, such as phosgene, in which comparison mustard gas found a relatively unimportant place, whereas the other side was stressing its vesicant action and the introduction of a new type of casualty producer which must be pushed to the utmost Later efforts, towards the end of the war, to design shell to give much greater atomisation of mustard gas were directed to obtain a combination of the two effects. This was a characteristic of later types of German yellow cross shell.

Developments in the sternutators, or sneezing compounds, were accompanied and delayed by the same kind of controversy. There was a division of opinion as regards diphenyl chlorarsine and its more volatile chemical relative, dichlormonophenylarsine. The latter showing signs of vesicant properties was competing with the diphenyl substance, which was more efficient as a sternutator and the judgment was confused. As the war went on, however, there was a tendency to develop the

guiding principle that these chemical weapons should be employed for a single and not a dual purpose; for instance, the best vesicant should be used instead of a substance which was a mild vesicant and mild lung irritant, and so on. Tactical consideration did much to compel this standard. Such points may seem to have academic interest, but the actual position is quite the reverse. To one with the opportunity of a comprehensive view of chemical warfare development at the front in research, administration, production and shell and container design and filling, it was as clear as daylight that the cumulative effect of such controversies represented months of delay Hundreds of thousands of pounds were spent, for example, on developing the production of compounds which were removed from the munition programme as soon as, and in some cases before, they reached the front. The latest recent addition during the war to the range of chemical weapons was an arsenic compound, a sternutator whose main interest and novelty lay in the curious after-effects which it produced and the specific threat to the enemy mask to which I will refer later.

I am trying to draw attention in this very brief manner to developments during the war, because they have peculiar bearing on any rational view of what may happen in the future. Any general tendency which can be established is of interest One can see a general development of intensity of chemical attack as regards the chemical type, the method of projecting it, and the corresponding defensive measures. Taking first the lung irritants and considering all fields of war, there was a general movement from chlorine on to the French palite (chlormethylchloroformate) and surpalite or the British di-phosgene (a very similar compound), and the British chlorpicrin, towards a general standardisation in all fields on phosgene, at least ten times as effective as chlorine, quite a good lung irritant and casualty producer, but with certain definite faults from the chemical point of view. In this class there was a definite trend of development in the projecting appliance. The old form of gas cylinder with its limitations of range and primary defect of having the surface of maximum concentration practically at one's own lines instead of those of the enemy, gave place to the Livens projector, which not only allowed the discharge to occur, at or near to the objective, but concentrated it within a much smaller radius. Whereas with cloud gas, the wide diffusion of the discharging apparatus could not be remedied as the cloud moved on, the same diffusion with the Livens projector had no essential bearing on the area of concentration of the cloud formed when the projectors reached their objective. It is well-known how this form of attack eventually practically broke through the German mask. This development in chemical type and concentration compelled corresponding changes in the gas mask. The organization of observation of

new enemy moves was, however, so efficient that the defence was in fact, until the very last stages of the war, able so to outwit chemical attack that the latter never became the decisive weapon which it might have been and may still be. I think that another few months of war would have seen such colossal production and discharge of mustard gas, phosgene and some of the newer types, that the above statement could not have been made with truth.

Lachrymators were mainly a shell proposition, and we can only point to a steady development of new chemical types. The sensory irritants, or sternutators, are more interesting. Their possibilities were first realised in shell. Technically it was known, and on the field it was soon proved in bulk use, that their particulate nature was capable of penetrating the mask and compelling its removal, thus allowing other chemicals to become effective. The fact that they were of the nature of solid particles rather than gases or vapours, implied that they might travel long distances and still remain effective, not being subjected to the decomposition, dissipation, and limitation of range which usually accompanied the liquids and gases. This re-introduced the possibility of discharge at long distances from the enemy, with the possibility of attaining him, and a suitable weapon was devised, termed a smoke-generator, which, although it was never used in the war, was so effective that it was difficult to find any territory in European allied countries large enough to make a safe test with a few thousand small generators.

On the defensive side, it is a fair generalisation, that during the greater part of the war the first type of attack, the lung irritant, and in general the chemical which required to enter the respiratory channels in the higher concentration, was successfully countered by the mask, although we must not forget that this was done at the expense of a great loss of efficiency and mobility in the combatant. But the vesicants and the more potent sternutators were never, in my opinion, successfully countered, and a little more time for ingenuity in their application and for their bulk production, would have seen them taking a very prominent and possibly a decisive part. Many attempts were made to protect against mustard gas, but in terms of results they were clumsy and inefficient. Masks were modified by all the belligerents to prevent the entry of the insidious particulate cloud, usually a sensory irritant, but the war stopped before attack and defence had really come to grips in this matter, and to put it mildly, it is extremely doubtful whether defence would have provided a successful answer, practicable under field conditions in bulk use. Opinions will differ in this respect.

The position at the end of the war is interesting. All the chief countries engaged had developed very active and efficient research

organization, using the term in its widest sense to cover exploration for new chemicals, design of projectors, containers, organization for field tests and liaison between all branches. They all had some form of field organization for attack and defence. In these features there was no such great disparity as in manufacture, for each country had been obliged to work up from rock bottom, but no amount of ingenuity and organization can neutralise the absence of production, and in this matter, owing to her colossal organic chemical industry, Germany began with an unquestionably great advantage. It was not until the very end of the war that the allies began to stem and turn the tide by means of their improvised chemical factories. German production was rooted in her normal commercial organization, while ours was an artificial growth. The other important point to note is that although for the greater part of the war, chemical attack and defence had kept fairly well abreast of each other, yet at the end of the war there were distinct signs that they might so diverge as to leave no answer, or an inadequate one, or one too delayed to be of use, to the new chemicals which were coming forward. This introduces what is probably the most important aspect of future development.

Comments on the Future.

Before dealing with this specific point, I would like to refer to the type of contribution to warfare which it is reasonable to expect may be added by chemistry. We have in phosgene a fairly successful lethal type, with the following limitations. It dissipates rather too rapidly, and is not truly persistent; modern protective devices resist it too well; it is too easily identified and requires rather high concentrations for maximum effect with corresponding quantitive disadvantages in regard to supplies, organization and armament accessories.

In mustard gas we have a substance without many of these disadvantages; it is persistent and waits hours, sometimes days, for a victim; is not readily dissipated; is effective in very small quantities; and with no generally known counter or method of defence. On the other hand, although it makes many casualties, these are not good in the military sense, as mortality is low, and a large number of combatants are soon back at the front. Chemistry, if invited to do so, might quite well develop a compound, combining the advantages of both and eliminating the disadvantages, giving the persistent lethal compound, effective in very low concentrations, very persistent, not easily identified, with a high rate of mortality and, in the absence of adequate defence, probably one of the few examples of a decisive weapon.

To go a step further, it might be admitted that if this were a possibility the persistent lethal compound would probably be of the type to

which the modern mask is an adequate reply. In answer I would say that it is not beyond the bounds of possibility that such a compound would introduce its lethal effects through the wounds involved in its vesicant action. It is quite incidental that the action of mustard gas substantially ceased, or dissipated, after its first reactions. Secondly, no answer has yet been given to the question as to whether physical and chemical research on particulate clouds will give the victory to the mask or the chemical, and it is quite feasible to imagine the development of a chemical with the general properties of the persistent lethal substances and the peculiar physical characteristics of the particulate cloud. We are here very largely in the region of opinion, but I personally feel, from general experience, that if such a problem were tackled by a vast chemical organization with the same energy, finance, ability and general facilities as, say, the classic development of indigo in Germany, or of nitrogen fixation in that country, and later in England, success would certainly be within the bounds of reasonable possibility. I am not going to make any detailed suggestions on these lines, first, because I am not personally inclined to do so, and secondly, because it would be highly indiscreet if I had anything of value. Let us return to the point of diverging lines of investigation. During war every enemy move is carefully followed. If you cannot anticipate a new chemical attack by a defensive move, you can adapt—if technically possible—at the moment when the first attack is made, and you have the position of the least tendency to diverge. But during peace this is not so. You have only to examine the fields of industrial chemistry and see how big organizations working on the same groups of products reach entirely different and novel results. Much more so would one expect two national organizations with the whole of chemistry as their field, and working largely in the dark of the other movements to diverge, not only in aggressive types but in defence. Naturally, each country would make its own defensive development move parallel with its own knowledge of aggressive possibilities. But it would be incredible to me personally to find, after, say, twenty years' intensive independent development by two great countries, that the defensive organization of the one could cope with the aggression of the other, and conversely. This introduces a chaotic element in chemical warfare development, which is not present to anything like the same extent in normal armament, and it makes one doubt the wisdom of intensive development on purely technical grounds, whatever one may feel about the matter, if some means can be found of agreed restriction. This is not the place to discuss the moral aspect of the matter, but on purely technical grounds, and based largely on the possibility of this chaotic diverging of attack and defence, I would always advocate movement in the direction of chemical disarmament rather than intensive armament if a rational scheme can be devised.

It was suggested that I should make some reference to possibilities of chemical warfare in the air and on the sea.

The combined use of aircraft and poison gas is a horrible subject, and constitutes one of the most powerful arguments for restricting chemical warfare. The conditions under which chemical warfare becomes most deadly and decisive are very simple, i.e., a stationary and dense objective coupled with a sure method of applying adequate concentration of the lethal chemical. It was largely the absence of these conditions in the war at the front which removed from chemical warfare the decisive results which might have been expected of it, but the combination of aircraft, poison gas and congested areas such as large towns, brings us to the other extreme, the possibility of maximum efficiency. A few simple figures will remove us absolutely from any charge of attempting sensational facts.

Dr. Owen, of the Air Ministry, has issued certain figures, based on actual measurements, showing the total weight of solid particles per volume of fog over the years 1926-27. They are in the region of 1 lb. per million cubic yards, a concentration of about one in a million by weight, which is higher than the effective concentration of a number of known war chemicals, particularly the new arsenic compounds. Assuming that such compounds dropped from aircraft would not dissipate into a layer more than a 100 yards in height, which is a very fair assumption in a large town, we find that less than a quarter of a ton of chemical would be adequate to cover one square mile. If we allow such a high factor as 100 to allow for the barriers which would prevent uniform concentration in the heart of a town we see the extraordinary ease with which a surprise aircraft attack, or a very large attack in which even 90 per cent. of planes were brought down, could introduce chaos and terror.

The sea is, in my opinion and subject to any cunning devices which may be produced, the least profitable field for chemical warfare, but this is only a relative statement. The main difficulty is the excessive speed of the objective and the fact that as a general rule atmospheric and wind conditions are such as to encourage rapid dissipation of the chemical. There are two general points to consider, first, the possibilities involved in a direct hit, and secondly, any devices which might encourage the persistence of a zone of gas over a large area. Undoubtedly a direct hit with a properly devised projectile should go far in the direction of very high casualty production and loss of ship control. I imagine that a gas cloud, and particularly one of the particulate type, would have an exceedingly good chance of breaking down or rather evading the system of compartments which must prove so effective against shell splinters, etc.

Such a cloud would be drawn into every part of the ship in virtue of the ventilation system, and the total volume is so small, in other words the concentration of the weapon and objective is so great, that a relatively small weight of chemical should be effective. One can visualise the enforcement of various protective devices in air passages, but I doubt whether the present state of knowledge on such matters could provide an adequate reply to a direct hit by a sufficient quantity of war chemical. This introduces the second point as to the best type of projectile. It is a question of hit or miss, and the practical answer is a machine gun effect instead of putting all one's eggs in one basket, i.e., a big shell. Whether a cloud of small projectiles could be operated at long ranges, or whether a kind of shrapnel effect is the answer, it would not be discreet to examine, and in any case it is a matter for the naval ordnance specialist.

The scientist and the chemist are to-day in an anomalous position. They know that if chemical warfare is to go on, it is no use tinkering with the problem, as it will be a matter of the utmost difficulty and a matter of considerable chance in any case to keep pace with a possible opponent.

It is not a question of keeping pace in the volume and ingenuity of development, but of the grave difficulty of being sure at any time in the future that one has any sort of answer to the devices of a potential enemy. This introduces an element of great uncertainty in any scheme for the limitation of armament. I am not using this point as an argument against such limitation, as my personal view is that it is absolutely essential and that if chemical warfare presents a difficulty it must receive a correspondingly greater amount of attention and effort in that direction. In the past the characteristic of disarmament discussions has been in the opposite direction. The new agencies of war were on the agenda at the Washington Conference and they are supposed to have received considerable attention at Geneva, but a careful reading of the records of both these assemblies leaves one with the impression that the specific nature of the problem has been ignored, just as it was without exception in all countries in the early years of the war. The latter has committed us, whatever may happen, to preserve a strong chemical warfare organization on the defensive side to cope with what is known and what has already appeared, but it is extremely doubtful whether it is wise in the interests of armament development and stability, quite apart from disarmament, whether intensive work in new fields should go on, and it is just this kind of work, i.e., purely scientific contributions and military investigation, which might be susceptible to restriction if dealt with in time. However, the unfortunate scientist does not know where he stands to-day in this matter, whether

his present lack of activity is a reproach to his patriotism, or whether if disarmament moves on he will be subjected to the grave criticism of posterity for the feeble but horrible contributions which he as a class has already made. I must be allowed to make these remarks, otherwise I shall appear in the false position of a whole-hearted advocate of chemical warfare, whereas my real desire is to see a development in the other direction down to a limit consistent with reason and stability.

DISCUSSION.

Mr. J. DAVIDSON PRATT: I have listened with very great pleasure to Major Lefebure's interesting lecture. I much appreciate the fact that he has adopted a most impartial and, I think in most respects, a non-alarmist attitude on the subject. There are however one or two points on which I am not altogether in complete agreement with him. First of all, he has spoken about the question of discovering agents of much greater potency, and he instanced as the type of thing required, the possibility of obtaining a substance with the persistence of mustard gas and the immediate lethal effects of phosgene. To my mind that is a contradicition of ideas; phosgene produces its immediate effects because it is very volatile and you can get very high concentrations. Mustard gas is not very volatile; thus you can only obtain low concentrations, and therefore it takes a long time to produce the effect. If however you take into account the quantity or concentration of gas and the time of exposure to the gas, that is to say, the actual amount which a man breathes into his lungs, you find that the quantity of mustard gas required to produce casualties is certainly no greater than that of phosgene. Therefore, if Major Lefebure wants to get a gas with the persistence of mustard gas and the immediate lethal effects of phosgene, he must look for something with twenty or thirty times greater intrinsic toxicity than any substance known to-day. You may ask: Is there any reason why such a substance should not be found? In reply, one may argue that chemistry, with all its many resources and its many millions of possibilities, can surely produce something more poisonous than the few compounds which we know. That is one point of view. The other point of view is one which was expressed at one of the meetings in Geneva. As this is now more or less public property, I am not giving any secrets away; the representatives of many nations who have been working at this subject and who have since the war prepared many new poisonous compounds, all came to the conclusion that—while there was always the off chance of so doing—the possibility of discovering an agent of greatly increased efficacy, against which the present protective devices would be inadequate, appeared remote. Accordingly we need not be unduly concerned or alarmed at the prospect of some wonderful development which will make all our gas masks and anti-gas defence quite useless. In this connection, may I remind you that in the realm of high explosives, no substances of greatly increased potency have been discovered, as far as I know, in the last twenty years, in spite of the fact that every country has been studying the subject. Why therefore should we expect remarkable discoveries in poison gas?

There is a point I would like to mention in connection with the quantity of gas required in the field. The Americans have compiled some figures from the war data to show the casualty producing effect of gas under service conditions. While in the case of H.E. shell, it takes I believe a ton of shell to kill a man, the American figures actually showed that it took a ton of mustard gas to kill a man;

a ton of mustard gas produced however about thirty casualties while with other gases one ton produced about three casualties. Thus while in theory mustard gas if properly applied could produce a large number of casualties running into thousands per ton, in actual use, one ton produced only thirty casualties and one death.

AERIAL GAS ATTACK OF TOWNS.

There is one other point to which I should like to refer in connection with which Major Lefebure painted a somewhat alarmist picture, and that was in regard to the question of the air menace. I do not think he developed all his arguments very fully from the technical side, perhaps due to lack of time, but I fear that the very small quantity which Major Lefebure quotes as required to produce an effect may prove misleading to the layman. First of all, the nature of the effect must be specified. The substance to which he appeared to refer would produce only temporary incapacitation from which a man is very little the worse afterwards; a man must also be exposed to the gas for a certain length of time which may be many minutes. Further, it must be remembered that the atmosphere is never still, so that the gas will gradually drift away with the wind. In the case of aerial gas attack, most of the people will be indoors when the bombs are bursting, so that the gas may drift down the street and affect nobody. My own frank opinion is that with a populace alive to the dangers and the precautions, which are very elementary, the damage to personnel and material which will arise from gas bombs is no greater, if not less, than from high explosive bombs. I want to say this because I know that much alarmist information has been written and broadcast about the horrors of gas attack from the air. It is essential that a sane judgment on the subject be preserved, otherwise people may be unduly alarmed and the methods of coping with such an attack in time of war may be relegated to the limbo of things which cannot be dealt with and so nothing will be done. Such a policy would be disastrous. Much of what is written on this subject is rather like the story in the American paper which talked about a wonderful new gas which was so strong that three drops on the tail of a dog would kill a man. (Laughter.)

MAJOR VICTOR LEFEBURE, in reply: With regard to Major Pratt's points: first, when I spoke of the persistent lethal compound, I was referring to the future. I merely gave phosgene as an example of lethal properties; but the compound of the future may operate on some function that has never yet been touched by any war chemical. The important point is that you may obtain in the future a compound combining persistent and lethal properties, i.e., the persistent lethal compound. Secondly, with regard to the question of air attack, we can only be guided by the faithful application of available facts and figures and careful reasoning. Excessive margins were introduced into the calculations in order to reply to such criticism as was levelled by Major Pratt. I pointed out that unless my calculations were inadvertently subject to an arithmetical error a quantity of about 400 lbs. per square mile was required to produce a concentration of an effective nature. The nature of the effect will depend on what the gas is. If you are dealing with the known gases, I quite agree that their effect, although they will produce chaos and so on, will not produce high mortality in such concentrations. But I was concerned with the future. We are not entitled to assume that chemistry with all its achievements cannot develop new types. Therefore, in view of the very low concentrations of some known gases which would be required, coupled with the remarkable possibilities of chemical development in regard to new types, I reluctantly disagree with my friend's reassuring criticism.

THE CHAIRMAN:

It is left to me to sum up the discussion. I desire to state at once that the ideas contained in this lecture, interesting as they undoubtedly are, are those of the lecturer only and have no official sanction. There are two views on gas warfare. First of all you get a brilliant scientist like Professor Haldane saying that gas warfare can be made so pleasant that really one would like to go to war. I do not think he will ever get a sailor or a soldier or an airman to believe that. He will send you to sleep (always a pleasant thing) for a couple of days with his gas, or he will set you laughing so hard that you cannot fight for a long time. Then he will make you deaf if you like, or he will make you blind. We all want to be deaf and blind sometimes for a very short period. Or, if he does not like you particularly, he will make you seasick. There is the other school of thought which makes gas warfare the most horrible and dreadful thing imaginable. Those of us who have been to war must have seen it, and seen the terrible sufferings that the men have undergone. It cost the lives of many and many a brave man, and we were saved from disaster by the wonderful work of our best professors and chemists in England. They thought nothing of their own lives, their fortunes or anything else. Their brilliant work not only put us on even terms with the enemy but allowed us to beat him at his own game. I do not think that their work has ever been adequately acknowledged.

Major Pratt would have us believe that the horrible side of gas warfare is not so horrible after all. We all hope that he is right. I do not propose to say anything more about the subject, because I happen to have held the position of Master-General of the Ordnance and have seen all that is going on in regard to gas warfare. I can only say that we have got the ablest chemists in England helping the War Office now to study the problem of defensive measures.

The customary vote of thanks to the Lecturer and to the Chairman brought the meeting to a close.

EXPLOSION OF PHOSGENE AT HAMBURG

ON the afternoon of Sunday, 20th May, a tank containing phosgene exploded in the Stolzenberg Chemical Factory, situated on the Hofe-Kanal at the upper end of the harbour district of Hamburg. Some 300 or more cubic feet of the gas were released. As a result eleven persons died, and a further 171 required hospital treatment. Had the explosion taken place on any other day but a Sunday, and that an Election Sunday, the consequence must have been immeasurably greater. Fortunately, also, heavy rain fell on the Monday morning and assisted in the destruction of the last traces of the gas.

Two young men fishing from a boat in the Hofe-Kanal were rendered unconscious, as also three persons on the further bank of the canal. In the course of the evening the danger increased. The fire brigades summoned to the scene worked at great risk, as the gas and smoke masks

in their possession were not suitable. Special phosgene gas masks had to be obtained from Berlin. A northerly wind first drove the gas cloud in a southerly direction, but a change later to south-east caused the gas to flow back over Wilhelmsburg (a suburb lying between Hamburg and Harburg). The effect of the gas was clearly to be seen on the vegetation far beyond Wilhelmsburg.

Women and children were affected on the Goldene Wiege beyond Harburg, six miles distant. On the Fishbeke Heide—eleven miles away—some boys were seized with sudden violent coughing and vomiting. In Altenwerden—some five miles west—the effects of the gas were strongly felt, the symptoms being malaise, amounting almost to fainting fits, and heavy attacks of coughing and vomiting.

The inhabitants of the gas-infected streets found refuge in the emigration halls of the Hamburg-America Line. Of these, in all some 350, the majority were able to return to their homes on Monday morning and the remainder in the afternoon of that day. All food-stuffs in the houses had to be destroyed.

The district chiefly affected was that of Wilhelmsburg. Here football players on the Jahnplatz were seized by severe stomach pains, while many people in the Kirchdorf district fainted.

Considerable uneasiness continued to prevail during the next few days, as fresh cases developed after being, apparently, free. Exactly one week later a man seized with violent pain lost consciousness on the way to hospital, where examination showed him to be suffering from phosgene poisoning.

It is now alleged that a year ago the Stolzenberg Factory endeavoured to dispose of some two and half tons of phosgene gas stored in steel cylinders by volatilising it up the factory chimney. Since this chimney is only forty feet high, only very favourable atmospheric conditions then saved Hamburg from disaster.

By agreement with the Allies, Germany is permitted to manufacture phosgene for commercial purposes, but only at factories licensed for that purpose by the Reich Minister for Commerce. It is officially stated that the gas was not stored at Hamburg for military purposes, and in view of the commercial value of the substance—amongst other uses it is employed in the manufacture of artificial silk—there is no reason to doubt the truth of this.

The police authorities at Hamburg made the following statement: "The Stolzenberg Factory received permission in October, 1927, to store phosgene gas on ground adjoining the Hofestrasse for the period

of one year. The police authorities were aware of the existence of the gas, and no concealment punishable by law has taken place.

"Measures have now been taken to destroy any stocks remaining at the Stolzenberg factory and no future permit of the kind will be issued. Similar dumps of phosgene do not exist in Hamburg. Phosgene gas is neither manufactured by the firm of Stolzenberg nor elsewhere in Hamburg."

An official enquiry announced that the gas dated from the war. Germany was not under obligation to destroy the whole of these stores, some of which were released by the "Bureau de Liquidation de Matériel de Guerre" for industrial purposes. Whether this actual store had expressly been so released could not be definitely determined. The report pointed out that the annual production in Germany is 1,500 tons, and the fifty tons stored in Hamburg was therefore a relatively small quantity. Since the gas was not produced at the Stolzenberg Factory, no offence against the War Material Law had been committed.

THE FUTURE OF THE BATTLESHIP:
TWO FRENCH OPINIONS[1]

By COMMANDER C. F. JEPSON, R.N.

HOW does a master mind set about the problem of designing a fleet for the service of his country? What are the factors that limit him? He will be guided by financial necessity, by political considerations and the strategy they demand, and by scientific progress and the consequent evolution of tactics. The problem of balancing these factors is extremely complicated for a first-class naval Power even when she has but one rival to consider; for impoverished France, midway between the greater and smaller naval Powers, the problem is as bewildering as any that confront the human mind.

It is but natural, therefore, that the two French naval officers whose essays are before us should confine themselves to broad indications of future policy.

Lieutenant Clavery, it is true, strays in spite of himself into the byways of detail and matériel. To do so is to wander indefinitely into a maze of hypothesis until the author's patience is exhausted and he lifts us abruptly back over hedge and ditch to the main road again.

Lieutenant-Commander Fénard declines to be led away from his main idea, namely, that a fleet must consist of a well-balanced assortment of types. Too often, he deplores, has France, encouraged by the inventive genius of her sons, imagined short cuts to naval supremacy, building dreams out of a new type of ship. With what result? Each new hope has proved an illusion, and the French navy has become time and again an experimental laboratory for other and wealthier Powers. Fénard presents us with a valuable history of the progress of naval matériel. The steamship, the screw-propeller, explosive shells, steel armour, the monitor, the fast armoured cruiser, the torpedo, the submarine, all are reviewed, together with the prognostications of their producers. The history of one is the history of all the others. The enthusiastic inventor outlines his hopes

[1] "Le Batiment de Ligne a-t-il vécu?" Mémoires présentées à l'Académie de Marine par M. le capitaine de corvette Fénard et par M. le lieutenant de vaisseau Clavery. Paris 1928. Soc. d'Editions Géographiques, Maritimes et Coloniales.

for the future, the blind controversialist proclaims them from the housetop, the public eagerly believes them. In the background saner minds analyse the new weapon or vehicle on scientific lines or from a purely military point of view. But these are unheeded; the politician bows to the popular storm, money is voted, a new type is produced. Within a brief space of time some other Power produces the antidote.

This psychological effect of inventions is not confined to France. Popular clamour and parliamentary polemics nearly stopped the building of the British "Nile" and "Trafalgar" in 1886. The torpedo-boat was to drive them from the seas. Mr. Hibbert, the Parliamentary Secretary of the Admiralty, confessed that he believed no more battleships would be built.

The arguments used a hundred years ago by Paixhans, the producer of explosive shells, employ the very language with which we are familiar to-day, coming from the blind partisans of the aeroplane. Equally have these arguments been used by the advocates of the primitive torpedo, of the locomotive torpedo, of the torpedo-boat, and of the submarine. What are the claims? Fénard quotes them to the verge of monotony. The new weapon is always to be cheap in both production and manning, and it is always to be invulnerable.

The ordeal of battle is needed to decide the comparative vulnerability of any weapon or vehicle, but a short space of time decides their cost. The initial cost per ton of a destroyer, says Fénard, is now about double that of a battleship, so is her complement of personnel per ton. The maintenance of the "Lorraine" (battleship) costs 315 francs per ton per annum, that of the "Bouclier" (destroyer) 1,460 francs.

Coming to the submarine we find that for every one submarine at sea in 1917, the Germans had two in harbour, resting or repairing. The aeroplane cannot arrive in contact with enemy ships without the assistance of an aircraft-carrier. Here the author has no cost figures for us but quotes the French General Staff declaration that each aeroplane on active service requires seventy men behind it.

Having dealt, almost too thoroughly perhaps, with recurring fallacies, Fénard proceeds to examine the battleship for signs of weakness. The submarine menace he discards; the magic hour of the submarine has passed; the notion that she could carry on a campaign unsupported at sea by surface ships has been denounced by Castex as "a strategical fraud." What of torpedo-carrying and bomb-carrying aircraft attacks? Fénard thinks little of the numerous "set-piece" experiments (*tirs de polygone*) carried out against warships by American aircraft. They prove that a bomb may sink a battleship; but so may a shell plunging beneath

the water. They give no promise of accuracy of fire. Here lies the weakness of the bomber. No one "spots" for her fall of shot, and if someone did, she has not the ammunition to profit by the corrections. She bases her claims on a few tremendous, but extremely lucky, blows; surface gunnery relies on a succession of weaker but more accurate blows.

But it is her reliance on the aircraft-carrier that brings the aeroplane down, so to speak, to surface conditions. If a battleship can be outmanœuvred by torpedo-aircraft or sunk by a "near miss" bomb, much more so can an aircraft-carrier. If the parent ship of aircraft can keep the sea by evolving new forms of self-protection or employing new escorts, so can the battleship.

The gun, Fénard thinks, is the one weapon that man can handle well at sea. Over no other weapon has he the mastery; they still leave too much to chance. The battleship, as we know her, is the highest expression of gun-power, and she must continue for many years to be the ultimate destroyer of the enemy's greatest strength. No other vessel can withstand or give blows as she can. She is not the ephemeral creation of an infatuated partisan. If she sins against the warning as to putting too many eggs in one basket, she is, unhappily for France, but an illustration of the overwhelming power of riches in war. In our daily life the rich can afford to venture more than the poor.

The battleship will continue, however, to be a strong basket; already the evolution of horizontal armour has begun. Soon we may see armoured gratings over the decks and greater space between decks. Protection against torpedoes will develop as fast as torpedoes themselves. The battleship's displacement cannot be foretold; it matters little—it will always seem too large in the eyes of poor nations.

Perhaps the battleship will merge into the fighting aircraft-carrier of the future.

No nation can wholly ignore nor wholly rely upon any particular arm. Attempts to illegalise submarines, or any other arm, are laughable: mere diplomatic histrionics. The mere existence of any weapon is sufficient to make it worthy of close examination. War will become more complicated, but the big-gun ship will remain; like artillery and the rifle ashore, it will not be dethroned by newer and less manageable vehicles and weapons.

Clavery takes a different view. Tactics, he says, have too often been exalted into the position of the dog that wags the tail, i.e., scientific inventions. He would have the positions reversed. And he does reverse them, with the result that his pen comes abruptly to a halt every now and again and has to retract a little.

Tactical science makes allowance for such things as weather conditions; material inventions do not until they are forced to. Clavery, for instance, makes no allowance for the fact that half a gale, which would not greatly disturb a battleship, would put out of effective action aircraft-carriers, seaplanes, coastal aircraft, wireless-controlled aircraft, and wireless-controlled explosive boats. All these vehicles he ranges against the battleship and points to her doom. Sceptical though he is of American experiments as reported in the press, he expects very shortly to see an aeroplane carrying a 26-inch torpedo, or, a little later on, a 3,600-lbs. bomb. Then, having decided that this aeroplaane would weigh between 10 and 15 tons, and span about 220 feet from wing-tip to wing-tip, he proceeds to consider the aircraft-carrier destined to launch her and recover her. This brings him to one of his abrupt pauses.

He admits that the low velocity at impact of a bomb is a serious disadvantage, and thinks the future may remedy this with some sort of gun for aircraft; but a few pages further on he claims that there is practically no limit to the weight of bombs since aircraft have only to drop them, i.e., they require no gun.

Nevertheless, the battleship is doomed. She cannot protect trade. She cannot support combined operations because she will be opposed by coastal aircraft. (Clavery here fails to recognize that a combined expedition will certainly have its own advanced air-base and coastal aircraft.) She cannot blockade the enemy's ports. "The war of 1914 from the naval point of view provides nothing more than the story of an imperfect blockade of the Austro-German fleets by the Grand Fleet at Scapa Flow on the one hand and the French squadron at Corfu on the other." This somewhat singular view of the war is preceded by the remarkable assertion that "the battleships of both sides remained inside their harbours for four years."

Clavery's remedy for all these defects in the battleship is to replace her gradually by cruisers. The "Maryland" with four triple 14-inch turrets and 21 knots, displaces 33,000 tons; the "Flandre,"[1] with the same speed and gun-power, displaced 25,000 tons. The extra 8,000 tons of the "Maryland" is mainly devoted to modern under-water protection. The modern battleship requires more armour and protective compartments than she can have unless her tonnage is increased. But her tonnage has been restricted by the Washington Agreement. To reduce her gun armament or speed in favour of more protection would be to remove her last traces of utility. The solution, therefore, is to remove her armour in favour of speed and to reduce her bulk in

[1] This ship was one of a group of four battleships projected in 1913, but never built owing to the war.

order to leave less target for the bombers. In other words, the line of battle of the future will be composed of cruisers. The nation that builds five cruisers for every one battleship formerly built will, with the aid of aircraft, be able to blockade the enemy's ports.

The era of the cruiser has already commenced. In future she will be of sufficient displacement to keep her speed in bad weather and will carry several aeroplanes. As for the aircraft-carrier of the future, Clavery thinks it premature to discuss her possible appearance in the line of battle; he pictures her rather as a scouting vessel of great beam.

Clavery awards the empire of the seas to the nation that follows the gospel of speed and numbers. He concludes his essay with a lurid picture of the harrying of a mammoth battleship by all the newer arms. She is eventually despatched by a C.M.B.!

Some points on which the authors agree are as follows:

(*a*) The co-operation of surface cruisers with submarine cruisers will be a feature of the next war.

(*b*) The torpedo-plane is exposed to great danger when stooping to deliver its attack. (Fénard thinks that we may some day see a glider-torpedo, capable of being dropped from a height.)

(*c*) The aeroplane's weapon *par excellence* is the bomb.

(*d*) The escorting force of convoys will require considerable development.

Some points of disagreement are:

Fénard.	*Clavery.*
The battleship will still be useful in support of landing operations.	Landing operations are a thing of the past.
The gun, aided by aircraft-spotting, improved sighting, etc., has a considerable future as the master weapon.	The gun has practically reached the limit of its development.
Aircraft and battleships never fought each other during the war. We cannot say what may result when they do.	To say that guns can parry the air menace is to hug an illusion.
The battleship remains the highest expression of offensive and defensive power.	The battleship is already a luxury, fit only for those gold-crammed nations whose pride demands the biggest things in the world.

The essays, though written in the early months of 1926 were not published until recently. Each was awarded a prize.

NAVAL USES FOR SEAPLANES AND FLYING BOATS.

A REPLY.

By Wing Commander C. H. K. Edmonds, D.S.O., O.B.E., *p.s.a.*

IN the February issue of the Journal there was published an article on Seaplanes and Flying Boats, which, when analysed, may be said to put forward the following five contentions, viz. :—

(1) There is no future for seaplanes ;

(2) The building of " freak " machines (e.g., that which won the last Schneider Cup) is of doubtful value ;

(3) Little or no interest has been taken by " the authorities " in seaplanes and flying boats ; and in consequence

(4) Seaplanes are practically no better than in 1914, and flying boats practically no better than in 1918 ;

(5) Insufficient effort is being made to use flying boats for fleet reconnaissance and spotting.

Since the subject matter of these contentions is of great importance to readers of the Journal, I think it worth while examining whether they are, in fact, justified.

Pre-War Conditions.

In describing the forerunners of the modern flying boat no mention is made of the Norman-Thomson boat, although it was a considerable advance on the old Bat-boat.

The Future of Seaplanes.

The author said that the Fairey III.D " is exactly the old 80 Short, with a higher H.P. water-cooled engine " and that " this is the total progress from 1913 to 1928." Now the Fairey III.D has an incomparably better performance than the 80 Short, which the writer of the article would doubtless admit. But this better performance is not due only to the higher horse power. It is too great to be attributable to one cause only. The fact is that in the Fairey III.D are found improvements in structural weight, durability, controllability and wing design. All these improvements, combined with the higher horse power of the

engine, have given the Fairey III.D a performance comparable to the best general purpose design landplanes, and this, in addition to the development of metal floats, which is mentioned later in the article, represents the progress from 1913 to 1928.

Before the battle of Troy, Hector prayed to Jove that his infant son might grow up to resemble him, but that the son might become in every way a better man than the father. Perhaps Mr. Fairey offered a similar prayer when producing his III.D. For though it naturally resembles the 80 Short, the design of which was largely the work of Mr. Fairey, yet it is a better machine all round.

As regards the so-called " freak " machines, built for the Schneider Cup race, the author of the article writes that " they are of no use for Service purposes," but that " many of the features may prove useful for embodiment in future machines." Now no one would ever suggest that these machines are useful for war. But in striving after the speeds necessary to win the Schneider Cup and similar races, designers have learned lessons of the greatest value, which in turn are applied to benefit the design of Service machines. To particularise, the Sopwith Schneider Cup winner of 1914 was the forerunner of several types of Sopwith fighters, which did excellent service in the Great War; again, in the Schneider Cup race it was found that by putting the carburetter at the back of the engine instead of at the front a cleaner nose could be obtained, and when this change was accordingly made in a certain type of fleet aeroplane, the speed was increased by ten knots.

And to generalise, it is common knowledge that the superior performance obtained on American machines a few years ago, compared to machines produced in other countries, was largely due to the air races and competitions held in the United States. These contests forced designers to " clean-up " their machines. It is not only by improving designs that such competitions as the Schneider Cup race benefit the fighting Services. To fly these racing machines, a team of specially selected Service pilots must undergo months of special training; the skill which they consequently acquire is bound to be an incentive to other Service pilots; and the whole standard of Service flying is advanced accordingly.

Therefore it does not seem unfair to say that in writing that " many of the features of freak machines (i.e., racing machines) may prove useful for embodiment in future machines " the author of the article we are considering has greatly understated the case. For the definite result of these races has been to raise the standard, not only of aircraft and engine design, but of piloting and physical fitness and endurance very greatly indeed.

We find it recorded that "the present writer sees no use for the seaplane in future, and believes that its place will be completely taken by the flying boat." If this opinion is likely to prove correct, then it is a mistake to go on developing seaplanes. Let us, however, examine this question of seaplanes and flying boats. Now, a flying boat, to be efficient, must be of considerable size; because, firstly, if it is small, it swamps in a lop; secondly, it is only in the larger flying boats that the combination of fuselage and undercarriage into the hull proves a saving of weight, and consequently a small flying boat is considerably heavier than an ordinary seaplane of the same size.

Now it is obvious that overseas work does not always require a large machine, of high power, with several occupants, such as a flying boat, and it is more economical and commonsense to use a smaller machine whenever possible. These smaller machines should be seaplanes for the reasons just explained. Moreover, experience shows that coastal operations occur from time to time, requiring aircraft at short notice. For these operations seaplanes housed in a carrier are suitable, as the carrier provides a self-contained mobile base, the sea provides a ready-made aerodrome, and use of seaplanes obviates the necessity of the ship being under way whilst flying is in progress.

Flying Boats in the War.

Without wishing in any way to deprecate the work of the late Commander Porte, to say that "the development of flying boats to their present state is almost entirely due to . . . Porte" seems rather unfair to those who produced the Sopwith Bat-boat and the Norman Thomson boat before the war, and those who have designed and constructed flying boats since Porte died.

Later Developments.

Under this heading we read that the "Felixstowe Fury," a flying boat of 1918, "has not yet been either equalled or surpassed," and in the last paragraph but one of the article we read "that the cruise to the Far East by "Southampton" flying boats now in progress, could have been done ten years ago."

That the "Felixstowe Fury" had a splendid performance there is little doubt. But it is a truism that any aircraft will fly well if it is built weak enough, and consequently light enough—until it breaks. And the "Felixstowe Fury" came to grief when trying to take off with full load. Whether this was due to poor hull design is not definitely known, although it is known that her wing strengths were not up to what modern practice requires.

The " Fury " was, as a matter of fact, intended to fly to Cape Town and she came to grief before she started. This proves that she, at any rate, could not have done what the " Southamptons " of the present Far East Flight are doing.

The only other type of flying boat contemporary with the " Fury " was the " F.5," and if flying boats of this type had attempted, as a service exercise and not as a stunt, a cruise as difficult as the Far East Flight, it is almost certain that they would have failed. The reasons are that they would have found great difficulty in " unsticking " with full load under tropical conditions, their cruising speed was rather low, their wooden hulls would have given trouble, and they had insufficient reserve of power to justify flying overland from Alexandretta to Baghdad.

After the description of the " Fury " the writer of the article goes on to say that " work on flying boats stopped at the end of the war, as the authorities considered they were useless." It is difficult to reconcile this statement with a knowledge of what occurred. For during the period 1919 to 1922—when there was very little money indeed to spend on new aircraft of any type—no less than seven new types of flying boats were produced. These were the Vickers' " Valentia " and " Viking," the Short " Cromarty," the Supermarine " Seagull," " Swan " and " Sea Eagle," and the Fairey " Atalanta." Although none of them were very satisfactory as Service machines, they served their purpose in that the knowledge and experience gained from them started a general improvement about 1923. About this time the old flat-bottomed hull was superseded by the stronger and more serviceable V-bottomed hull, and metal construction superseded wood. In result we now have the " Southampton," though it is hardly correct to say that " this represents the latest development," because the Blackburn " Iris " and Short " Singapore " boats are in some ways better.

The Future of Flying Boats for Naval Purposes.

Under this heading the use of flying boats from a carrying ship, for spotting and reconnaissance, is advocated. Admittedly this is an interesting idea, and not impossible. Yet it does seem that the writer of the article has not fully weighed the disadvantages of his scheme. First, there is the principle to which reference has already been made—call it common sense or economy of force. Why use multi-engined machines with a numerous crew if smaller machines can do the job? And then this flying-boat carrying ship is going to be rather a difficult proposition if she is to take boats big enough to be of any use, bearing in mind that the " Southampton " is about the minimum size for efficiency. Also the tactical disadvantage that when she slows down, or stops, to launch,

or hoist out a flying-boat, she becomes vulnerable to submarine attack, appears to have been overlooked. The increase of the structure weight of the flying-boats to make them capable of being hoisted—probably about 10 per cent.—has been overlooked as well.

Very few experienced pilots will, it is believed, agree with what is claimed under paragraph 5 of the advantages of using flying-boats for fleet air work, i.e., that they do not require an escort . . . and have nothing to fear if they come down to about 100 feet. . . . In the time that it would take a flying boat to get down from a few thousand feet to near sea-level, a well handled fighter might get a very good chance of attacking. Even if the flying-boat is not damaged, it is forced to discontinue its work, and to accept a precipitate descent as a standard method of defensive tactics seems weak.

I have now commented on a number of statements made in the article. In result, I think it may fairly be said that the five main contentions enumerated at the beginning of my letter, and which seem to be the gist of the article under review, cannot be accepted without much reserve.

In general, whilst not advocating complacency, I believe that much more progress has been made than the writer of the article realises, while the inclusion, in this year's Air Estimates, of a large sum of money to provide a hull and float testing tank at Farnborough, shows that the authorities intend that this progress shall continue.

THE TRAINING OF THE ARMY OFFICER

By MAJOR J. M. MILLING, M.C., *p.s.c.*,
The Bedfordshire and Hertfordshire Regiment.

I.

TRAINING matters are always controversial since every so-called expert has his own views. So training, whatsoever form it takes, may be guaranteed to change with the coming and going of the individual. This, as a matter of fact, may be all to the good, seeing that change oft-times produces progress, and progress is essential to efficiency.

Yet, in spite of all the changes which have swept the Army during and since the war, the training of the officer, the ordinary regimental officer, that is to say, has remained in principle more or less stationary since 1914. To-day it may include a greater number of weapons to be mastered, longer hours, rather more tactical exercises without troops—according to the nature of the C.O. or other superior officer—but the routine is there just the same as ever, the system of training and instructing the officer remains almost identical, save perhaps that he is made to pay more care and attention to the preparation of exercises. His is still the joyless task of supervising; as subaltern he continues to perform for the greater part of the year the same insignificant duties his kind has performed for decades; as company commander he consumes hours of labour over matter of pay and administration; as senior major he struggles with innumerable accounts and ledgers, the petty details of the Regimental Institute, spending what little of his time remains, and may be much of his leisure, in what should be his legitimate duties, the teaching of the higher aspects of war.

II.

Before continuing let us be clear on the point of whether or not present methods are both effective and sufficient: do they achieve their end? If so, then why change them, or even suggest changing them? And, if this is the answer, then the object of continuing further is gone. But are they?

General Serigny, writing of the French Army, says: "The daily routine in barracks, which is the way in which our officers spend three-quarters of their service makes them analytical." He speaks of this system and its results as harmful, suggesting as a remedy the sending of officers to take courses at the great schools, to study the great social and economic organizations of their country, and so on. His suggestions provide a thoughtful and reasoned statement. Its logical thesis is obviously sound. But it is, for us at any rate, equally obviously visionary. Financial reasons alone put it more or less by the board. But are not his remarks, when regarded broadly and from our own point of view, applicable to ourselves? Do not our own regimental officers also spend some three-quarters of their service in barrack routine? Is it not apt, moreover, to make them analytic—over inclined to the study of detail, to become small-minded, to give greater consideration to the small issues? Is not the production of the synthetic mind—the power to think big, to see big—of equal, if not greater importance? Both sides of the mind should be equally developed, yet we may doubt whether our system tends to that end. It scarcely seems that it can do so.

Addressing the students at the Senior Officers' School, lately, a General Officer made the following remarks: "The officer is in danger of losing his status. The N.C.O. is knocking at the door. Note the 'Y' Cadet at Sandhurst carrying off the highest honours. Let him [the officer] therefore study the higher sciences. Let him thus by the application of greater knowledge retain his superiority."

Here, then, are two views which reflect directly on the present educational and training standard of the regimental officer. Supported thus, and in particular by the remedy suggested by the latter opinion, the writer would summarise the answer to the question he has raised, as follows:—

(*a*) Our present-day training methods are not sufficient;

(*b*) They require raising to a higher standard;

(*c*) In order to do this, it is necessary for the officer to spend more of his time than he does at present in the study of the higher aspects of war.

III.

Now the regimental officer is divided broadly into two types. The first is composed of the true regimental officer, the man who is content with regimental service, whose ambition soars to no greater heights than to remain with his unit and one day perhaps to command it. The second is the man who aspires to higher things than those offered by the routine of ordinary regimental existence, the staff, colonial service,

and so on. But both these types are good, both equally valuable soldiers, and, as such, equally essential to the Service. Furthermore, it is equally essential to the Service that both types do exist. If it be desired, therefore to raise the standard of the training and education of the regimental officer as a whole, it seems necessary to strike a note of warning, for in driving him thus to a higher plane one may incidentally run the risk of eliminating the first type. There must always be that side to the question. It must be remembered that the long hours of business as compared with the shorter hours of the Army have their compensation in the prospect of increasing financial prosperity. Army pay and pension can hardly be placed in the category of financial prosperity. Yet they are sufficient, provided the advantages enjoyed by the military man, in the shape of greater leisure, better facilities for sport and games, over his civilian *confrère* in business are left to him. Various changes that have come over the Army and our social life have done much to unstabilise the position of an officer: longer hours, less time for leisure, a greater number of bad stations, to-morrow's uncertainty—bad above all for the married man—all these combine to depreciate the prospects of the Army as a profession.

Modern warfare, moreover, with its poison gases and its new methods of dealing destruction, is becoming merely brutal. The Corinthian days of Chillianwallah are gone. The martial classes are passing away with them. The man in the street to-day may be just as much a soldier as the professional. The glamour of the battlefields of the business world have usurped much of that of the battlefields of war, offering greater rewards. All this undermines the past inducements to enter the Army. Thus, in seeking opportunities to press the higher study of war, it behoves one to be careful. In fact, what one should look for is not longer hours, but rather the substitution of some portion of the normal working hours at present devoted to barrack routine.

IV.

How then to find the time?

Let one turn again to the General Officer's words, already quoted: "The N.C.O. is knocking at the door. Note the 'Y' Cadet is carrying away all the highest honours." Actually, whether the N.C.O. is really knocking at the door, or whether the 'Y' Cadet can in all truth be regarded as belonging to the true N.C.O. class and used to substantiate the first statement, it is not proposed to enter into controversy. But the words themselves do serve their purpose, in that they are pertinent to the solution of the question under consideration.

At the very opening of the Great War we saw the immediate swelling of the officer cadres by the raising of the senior N.C.O's to commissioned rank. During the latter phases the ranks were being combed to fill the junior commissioned ranks, battalion and brigade commanders protesting they had nothing to produce, yet under compulsion sending of their best. And what a best! Yet it sufficed. Those were the officers who led their platoons to victory in 1918. The higher responsibility was placed upon them; the crisis was great; they rose to the occasion and did their best. Why then not impose the higher responsibility on the N.C.O. in times of peace? The material is there. Most serious minded soldiers will agree that, with the higher education of these days, the mentality of the rank and file is higher than before the War. It follows, then, that the mentality of the N.C.O. is similarly higher. Conditions, therefore, seem to be favourable.

Now, the special *métier* of the N.C.O. is obviously barrack square work—individual training. But this training is in practice already carried out by him—under the supervision of the officer. Thus the point at once arises, how far is this supervision essential? If it is necessary, well, there the matter ends; nothing further remains to be said. But is it? Would it not be possible to impose the full responsibility upon the N.C.O., reduce the supervision, and leave him to do his real work. The "old die-hards" may mutter "nonsense!" It would, no doubt, come as a shock to regimental custom of decades. But why not disturb a few more of its already disturbed foundations, and begin to build once more afresh? Evolution or dissolution—that is the law of a remorseless Nature. Why not try? If it fails, it will not produce irretrievable harm. If it succeeds, if the N.C.O. is found able to shoulder a responsibility considerably greater in peace than he has ever before been called upon to take, that is, to carry out the task upon which rests the remainder of the year's training, he automatically raises his own standard to no small degree; and does this alone not tend to the general good? But the main feature is that it produces the time for which we are searching, in that it relieves the officer from the task of supervising, thus freeing a not inconsiderable period of his normal working hours for the study of higher matter.

V.

There are many sides to this question, but the writer proposes to deal only with three:—

(*a*) *Accountancy and Office Routine.*—It is difficult to define exactly how much of the time of senior regimental officers is absorbed by office routine and accountancy. But it is obvious that a very great period

is at present devoted to such items as keeping accounts and paying out. If the major portion of this *barrack routine* could be taken out of their hands, there would still result a saving of valuable time. Would it not be possible to centralise the present Company administrative staffs under, say, a Regimental Paymaster, and a Regimental Accountant? If finance could not accept such an increase to establishments, there would seem to be no great, if any, loss of efficiency in an infantry unit by the reduction of its present fighting personnel by one, or if necessary, two officers, these being utilised to form the suggested pay and accountant staff under the ægis of the Royal Army Pay Corps. In itself it would reduce the existing channels of correspondence from five to one. Moreover, the suggestion would seem to be equally applicable in war. If there is any particular stress laid by some on the advantage of a Company Commander paying out his own men, this can still be done without any particular inconvenience to him or the scheme as a whole.

(*b*) *Education.*—Is there any particular advantage to be gained from the regimental officer being made responsible for the education of the rank and file? The Army Education Corps is now in being. Cannot it take over this responsibility from the regimental officer? The results obtained by a professional teacher must surely be higher than those obtained by an amateur. At least the process of reaching the Second Class Standard would be accelerated—no small thing. If anything is apt to make an officer analytical it is this process of working up the rank and file to necessary educational standards. Once more, if finance cannot approve, reduce the fighting establishment by yet another officer if it must be so. Why should not the Education Officer assume also the duties of Messing Officer? It would all tend to the freeing of the remainder for the study of war.

(*c*) *Seconds-in-Command.*—That the Second-in-Command of a battalion must be a "whole timer" from a training point of view is obviously essential if our contention is to be justified. If officers are to study the higher sides of war, some kind of senior instructor must be at hand to co-ordinate their study and to teach. Yet at the moment what is the sphere of the Second-in-Command? Would it be very wide of the mark to hazard the reply—generally accountancy, a mass of detail arising out of the interior economy of the unit? And why? Mainly because both Commanding Officer and Second-in-Command may sleep with some sense of security. Fraud, a post-war bogey which appears to be only too real, and the penalties attached to its existence cause wise men to think and to act accordingly. That some supervision should be a portion of the duties of a Second-in-Command goes without question But is it really necessary for him to do everything King's Regulations

alone lay down that he shall do? Yet, placing these tasks before the higher training and instruction of the unit is both wasteful and wrong. If the suggestion put forward in (*a*) were adopted, then the difficulty would automatically disappear. If not, then there remains only one course, and that is to make, say, the four next senior officers in turn carry out the prescribed office duties and such other matters of routine as the particular unit may require, for a period of from three to four months, the responsibility for any "regrettable incident" which may occur during their individual tenure automatically resting upon their shoulders. This system would also possess certain benefits, for the multitudinous duties of a Regimental Institute form an excellent training provided they are not given in too large doses.

It should be essential, however, that no officer should be permitted to become *ipso facto* a Second-in-Command unless he has qualified at the Senior Officers' School or the Staff College. The conversion of this position into an appointment—as is already done in principle in the Indian Army—could be advocated. An utopian dream would be that the course at the Senior Officers' School should last for not less than a period of six months to a year. It would have the two-fold advantage of (*a*) providing a single and up-to-date school of thought, and (*b*) making more or less certain of good instructors. In the author's humble opinion the Senior Officers' School is essential to the conception of the suggestions put forward in this paper.

VI.

The three suggestions put forward in Para. V have been dealt with together, and separate from that first put forward in Para. IV, since they depend so greatly on finance, and therefore greater difficulty must be found in the adoption. At the same time, it should be observed that to put the first of these suggestions into effect the provisions of the fourth suggestion (Para. V, (*c*)) are essential, but that, if finance debars its first alternative, the second is still available and should be easily adopted. There seems no valid reason why this suggestion at least could not be tried during the next winter training season. A brief sketch of a suggested allotment of the five winter training months might correspond to the following scheme:

(A) 1 month—two companies individual training;
1 month—remaining two companies individual training;

(B) 3 months—leave period and N.C.Os' training.

During (A), all officers would be relieved for study and training under the Second-in-Command. All individual training, including specialist

training, such as machine gun, signalling, transport, cadre classes, etc., under the Warrant Officers and N.C.Os.

During (B). two companies at a time would do a fortnight's intensive N.C.Os' training. If this should be considered insufficient, a simple tactical exercise or war game, at which all officers and N.C.Os would attend, might be held on one evening each week during (A).

VII.

Finally, viewing the present dearth of candidates for commissions in conjunction with the necessity for keeping up the standard of the officer class, and if the supply cannot again be made to exceed the demand, there still seems one possible course left open to maintain that standard, that is, to reduce the number of officers. Allowing then that this contingency is not impossible, and that the question may one day arise of replacing the present junior commissioned ranks by N.C.Os or Warrant Officers, the preliminary testing of the N.C.O. on the lines herein indicated would at least give a logical basis upon which to work, should such an emergency ever arise.

THE TOAD BENEATH THE HARROW

A STUDENT'S VIEW ON THE SENIOR OFFICERS' SCHOOL

By MAJOR R. H. ALLEN, M.C., *p.s.c.*, R.A.

THE arguments for and against the Senior Officers' School have been put forward in the JOURNAL by two instructors from those Schools, while a former chief instructor of the late Junior Officers' School, Northern Command, India, has joined in the debate. As their views are fundamentally opposed, it may be of interest to add thereto some opinions of one who has passed through the School, i.e., from the standpoint of the toad beneath the harrow.

First, then, let us summarise the views of the contestants. Lieut.-Colonel Brighten of the Belgaum School leads off the attack. The gist of his contention is as follows. The vast majority of the students are ignorant, and not merely ignorant but self-sufficient in their ignorance. "It is human nature that he should be self-satisfied in such conditions." They are all of mature age and too old to learn. Consequently, they do not absorb the doctrine taught at the School. The proof is that this doctrine has not percolated through the Army as it should, seeing that each successive batch of students is as ignorant as its predecessor. "Why has that not been explained to me in this way before?" is their cry. This view that the doctrine taught has not permeated the Army has been officially endorsed by the C.I.G.S. at home and by the General Staff in India. Therefore, let us abolish the School for Senior Officers and catch the keen young captain and pass him through a Junior Officers' School. Thus we may get a common tactical doctrine imposed upon the Army.

Lieut.-Colonel Burrows so far endorses this view by stating that the teachings of the S.O.S. are not disseminated throughout the Army mainly owing to lack of time. "It is impossible to teach combined tactics during the everyday routine of regimental duties."

He, however, advocates the retention of the School in view of the great value obtained by the individual during the course, even though

the latter fails to pass on the knowledge acquired. Nevertheless, he strongly emphasizes the need for a Junior Officers' School as the one channel for imparting the universal doctrine to the Army at large.

Colonel Sandilands of the Sheerness School, in a trenchant article, presents an overwhelming case for the Senior Officers' School. He clearly demonstrates the advantages obtained by the individual and earns the gratitude of the toad by saying that he is not such an ignorant toad after all; moreover, that, in the mass, he actually polishes the harrow as it passes over him. But he does not deal with the question of the ability of the toad to hand on his acquired knowledge to others.

Now, what has the poor toad to say about it?

The first accusation is that he is a very old toad and that his mind is not receptive of new teaching. Well, it is quite true that he is old, and daily becoming older, as the age at which he may aspire to reach command is rising rapidly—at any rate in the Royal Artillery. But is he really "too old at forty?" Most of us in our time have presented a pitiful tale to higher authority to excuse some favourite N.C.O. from the onerous task of acquiring a first class certificate of education on the grounds that he was no longer mentally pliable. Candidly, we have usually had our tongues in our cheeks while so doing, and the almost universal rejection of the plea shows that it is not officially acceptable.

The next accusation, namely, that he does not pass on the information imparted to him, is made on broad and indefinite lines. Such assertions, unless backed by particular detail, carry little weight. The writer, as a subaltern, remembers how, when his Battery Commander used to return from leave, on the general principle that chastisement is good for subalterns' souls, would make the broad assertion: "Your horses have lost condition!" Now, as a very young subaltern the toad had learned something from the present Inspector of Royal Artillery; so he used to have his horses weighed. Then when his Battery Commander, who was withal a fine horsemaster, made his usual statement, the subaltern, secure in the knowledge that his horses had gained an average of half a stone apiece, smiled discreetly to himself. The toad in that same spirit proceeds to examine the alleged proofs that the students at the School have failed to pass on the teaching acquired.

First, there is the definite statement that at least 75 per cent. of the students who arrive at Belgaum had not acquired from their predecessors a precise knowledge of the beaten zone of a machine gun, nor the details of battle administration of a battalion, e.g., the amount, location and method of carriage of his ammunition, tools, stretchers, etc. To this the toad pleads guilty. It is also perfectly true that a brother battery

commander who preceded the toad at the School had failed to impart these details of infantry organization ; yet this brother toad *did* impart much information on tactical questions, and *did* pass on much that was being taught in the way of doctrine. Still he definitely failed to pass on the information in question. Whether infantry majors similarly failed to teach their colleagues the precise limits of the 50 per cent. zone of a 4.5 in. howitzer at 4,700 yards, or the exact percentage and location in the limbers of the gas and smoke shell carried by an 18-pdr. battery, the toad cannot tell, but he has a shrewd suspicion that they did so fail. At any rate he found at Sheerness that details of this nature were not imparted in any considerable quantities.

Next comes the query, that apparently rose so frequently to the lips of the students at Belgaum : " Why has that not been explained in this way before ? "

Well the toad cannot answer for Belgaum ; but there comes before him a picture of Sheerness. On his left sat a R.H.A. battery commander from St. John's Wood, on his right " Feisal," a distinguished leader of Iraq levies, further away a late adviser to the Kashmir State Forces, immediately behind an occupant of a stool in the S.D. Branch of the War Office, flanked to right and left by a D.C.R.E. from Hongkong and a manipulator of traffic problems on Indian Railways. It may be imagined that officers drawn from such varied and interesting employments might fail to show signs of recent contact with students of the School. This summary of the occupations from which a few of the students were summoned should, in itself, be sufficient explanation as to why eight years is an all too brief period for the statistician to expect returns. Incidentally the toad, with a passion for accuracy, cannot but comment on the fact that the Belgaum School began work in 1921, while Lieut.-Colonel Brighten was writing, at latest early in 1928. Further, if these eight (*sic*) years be examined more closely, the toad finds that it was not until 1924 that a permanent and complete edition of our Field Service Regulations was issued, while, even now, there is foreshadowed a complete revolution in at least one important dogma, namely, that " Infantry is the arm that in the end wins battles." If, then, our basic doctrines were not published until 1924, and have been undergoing such changes from 1924 to 1928 that one of the most important tenets is to be reversed, can it be wondered that in this brief period a universality of doctrine has not become common to all officers of the Army ?

Thus the toad is not in any way convinced that the failure to impart knowledge is definitely proved against the students of the School. Still,

for sake of argument, let us admit that there is no smoke without a fire, and that the torch has not been handed on.

The remedy, it may be hoped, has now been found, not in the abolition of the Senior and the substitution of a Junior School for the mentally more pliable, but in the alteration of the conditions of the course. In his remarks at the conference held at the Staff College in January, 1928, the C.I.G.S. foreshadowed this change when he said: "I must again impress upon you the importance of getting your Commanding Officers to understand that their duty is to train their junior officers. I have been pointing it out to Colonel Fisher and telling him to carry this out at his school." This very definite instruction of the C.I.G.S. completely disposes of the argument that senior officers can find no time to impart instruction to their juniors. In future they will have to make it.

Here the toad would like to proffer one small suggestion. He strongly agrees with Lieut.-Colonel Burrows in paying the instructional staffs no more than their just due when he calls them "a first rate team"; the knowledge exists without a shadow of doubt. But it is not within the power of every man who possesses knowledge to impart it. It has been said of the Pundit: "You must not expect him to teach; he is a mine simply, in which you must dig for what you want. One thing you may depend upon, that whatever you extract from that mine will be worth having, indigenous treasure."[1] The toad therefore suggests that an ability to impart knowledge should, in the selection of officers to act as instructors, be as great a consideration as the possession of that knowledge—or of an exceptionally brilliant record of active service.

If, indeed, we are old toads and are rapidly growing older, it is inaccurate to say that we are too old to learn. If that were so we should all have to retire in the forties on the ground that we cannot learn the rapid alterations in methods of war that are taking place from year to year. Eight years is not an adequate period on which to base the argument that the ignorance of succeeding batches of students proves the failure of their predecessors to disseminate their knowledge—particularly so at a time when our fundamental doctrine is passing through a critical phase to a modicum of stability. Admittedly our knowledge has not been as freely circulated as should be, yet this shortcoming can and will be removed, if—as has been ordered by the C.I.G.S.—officers are taught how to teach, and on attaining command must concentrate more on the instruction of their juniors. These premises admitted, the case for a Junior Officers' School is incredibly weakened without even the necessity for examination of the one essential for its foundation, financial provision.

[1] E.H.A. "Behind the Bungalow."

In view of Colonel Sandilands' fluency and skill in proclaiming the usefulness of the Senior Officers' School there is little need to say more than to disagree with him on one point; it is that those who mostly stood in need of the harrow of his kindly irony are just as stout upholders of the School as the brilliant students who instinctively felt the need of the School on arriving there. The appreciation and gratitude of the former class is none the less real for being inarticulate.

THE PROGRESS OF MECHANIZATION IN THE UNITED STATES ARMY

By CAPTAIN G. MACLEOD ROSS, M.C., M.Eng., A.M.Inst.C.E., R.E.

MARSHAL FOCH is reported to have predicted that a war of the future will find ten men employed in industry to maintain one man operating machines of war in the battle area, whilst in a recent lecture Sir Frederick Maurice pointed out that the success of a policy embracing mechanization depended very largely on a sound manufacturing and industrial basis. In view of the manufacturing potentialities of the United States it is not surprising to note that considerable attention is being paid to the possibilities of mechanization.

In the summer of the present year the U.S. War Department has decided to follow the lead of Great Britain and to establish an experimental armoured force composed of several arms and branches of the service in order that the theories evolved by the General Staff may be given a really practical trial. The assembly ground has been chosen at Camp Meade (to be renamed Camp Leonard Wood) near Washington, D.C. so as to be under the eye of the War Department.

The composition of the force, which bears a striking resemblance to the units originally chosen to form our own armoured force, is as below :

The 34th Infantry Battalion.

One platoon 4th Tank Company.

One battalion (less one battery) 6th Field Artillery.

One battery 61st (Anti-aircraft) Coast Artillery.

One company 1st Engineers.

1st Signal Company.

Medical detachment.

1st Ammunition Train.

In addition, there will be available :

The 16th (Light) Tank Battalion.

The 17th (Heavy) Tank Battalion.

One observation squadron of the Air Corps.

Further, one troop of the 3rd Cavalry will be trained in the use of mechanical equipment and will operate with the Mechanized Force which will be under the G.O.C., IIIrd Corps Area.

Major-General C. P. Summerall, the Chief of Staff, speaking to the Army War College on the war of the future says :

" It will not again be justifiable to exhaust infantry by long marches when they can be transported by motor vehicles, nor can we conceive a repetition of the slaughter of assault battalions when the enemy's organization can be shattered by bombing and attack planes, and by tanks."

The U.S. War Department, commenting on the place of the tank in war, said :

" The mechanized unit would provide shock troops of great striking power and limited holding power. It would relieve the infantry and cavalry from functions of attack in certain critical situations that under present conditions prove most costly in human life to the attack force. In such attack the mechanized unit would give its own operating force better protection than is possessed by attack units, owing to mobility and shelter. After an attack by a mechanized force the infantry could advance through lessened hostile resistance to consolidate and hold gains in ground.

" The future of tanks is a key to new developments in the battlefield tactics of the future. The tank of the World War, formerly regarded entirely as an auxiliary of the infantryman, is thereby considered to have undergone a complete transformation with the ten years' advance in the automotive industry.

" While the tank will in certain circumstances continue its rôle of directly assisting the infantry, the study portrays the tank of the future as the nucleus of a new battlefield unit, a mechanized force. The tank was an infant in the World War and merely crept along. Now it has grown up and learned to run. Speed has been increased from six to eighteen miles an hour."

Discussing the operations to be carried out by the Force it is further stated that :

" As far as practicable, this force will be equipped with motor vehicles of the latest approved design. Its operations will include work over terrain sufficiently varied and difficult, and under such conditions of weather as will determine the powers and limitations of motor vehicles as compared with animal-drawn transportation under similar conditions."

This mechanized unit is visualized not as a part of the infantry or the cavalry but as a new arm of great striking power and mobility, embracing 2,000 to 3,000 men.

"Such a unit would have within itself means for reconnaissance to a distance and transmission of messages beyond the power of horsemen. It would combine the striking power of fast tanks with the holding power of infantry strong in machine guns. It would have its own artillery, specially trained to its peculiar method of combat, and the necessary means to maintain itself independently for a period of time. It must be viewed strictly as an offensive force with but temporary holding power."

The opportunity is also to be taken of inviting all manufacturers of motor vehicles, capable of adaptation to military use, to submit models for test by the Mechanized Force with a view to determining suitable types, whilst the study and development of these is to be undertaken by the chiefs of the army supply branches concerned.

As regards the Army generally, the internal combustion engine is to be exploited to give increased mobility, to conserve the energy of man and beast, and above all, to "back up" the fighting forces. The vital necessity for maintaining the impetus of the attack whether by means of fighting troops or by supplies is not the least of the lessons of the war. It has already been suggested that the Germans would have achieved greater success had they diverted some of the industrial energy that was expended on submarine building to tracked transport capable of supporting more rapidly their attacks in 1918.

The battle of Messines is invariably cited as a classic example of a successful attack with a limited objective, but there can be little doubt that much of the success of that operation, viewed as a whole, was due to the fact that good weather favoured the use of cross country tracks, which permitted supplies to be got forward in sufficient quantity and in good time, thus ensuring the consolidation of the position won.

The U.S. Army appear to lay great stress not on a speedier attack alone, but also on an equalization, as far as possible, of the rate of movement of the heavy supporting organization of an Army with the actual attack. It is in this connection that the light, universal, tracked chassis which is described in greater detail below is of considerable, interest.

Roads may exist, and it may be that conditions of mobile warfare will not result in their being destroyed to the extent that occurred in static warfare, but it is doubtful if they will ever be on a sufficient scale in the required direction to support adequately the number of vehicles requiring to use them in a given period. Hence the necessity for a supply vehicle capable of moving across country. There are no indications, as yet, that any attempts are to be made to "try out" aerial supply,

which has recently been mooted as the final solution to the supply problem of an Armoured Force.

Some recent experiments which have been made in transporting horsed units in mechanical transport vehicles include the haulage by motor lorry of "F" Troop, 5th Cavalry, in October, 1927, from Marfa to Fort Clarke, Texas, a distance of 300 miles. The time taken was thirty-six hours and the route covered graded dirt and gravel roads, seventy-five miles of which were hilly and rough. This troop was completely horsed and equipped, ready to dismount and operate at the shortest notice. On the first day, 160 miles were covered, and the remaining 140 miles before nightfall on the second day, when the final destination was reached. The troop was then in good condition, ready to take the field.

It is stated that it is intended to retain the horse for use on terrain, for which it is especially fitted and the War Department adds that :

" If the utilization of motor trucks as a means of transportation increases the rate of march and radius of action of cavalry as much as is indicated by this experiment, it will exercise a considerable influence on the future employment of that arm."

Battery "A", of the 1st Field Artillery, was also moved by motor lorry from Fort Sill, Oklahoma, to Marfa, Texas—700 miles—in nine and a half days marching time. Returning, the battery covered 714 miles in nine days marching time, or ten and a half days total time. In this same connection, and although details are lacking, it is interesting to note the performance reported in *The Times* of 9th April, 1928, at the trials of six-wheeled vehicles in India over the Sind Desert and on the North-West Frontier, where the terrain included mountainous country, rough roads, rocky nullahs, mud tracks, sandy river beds, trackless wastes, and deep water courses. A distance of 783 miles was covered in nine days in one test.

In the U.S. Army, tank development is stated to be working towards two objectives : the first being the mammoth or passenger carrying tank. Whilst the practical difficulties are acknowledged, policy desires an armoured fortress capable of transporting, say, half a company across country and giving it immunity from machine gun fire. It is a little difficult to take this proposal seriously, and its utility, save against a " savage " enemy, is doubtful.

The second objective is the light one or two-man tank, carrying a machine gun, and suitably armoured. It is hoped that it will be possible to devise controls so that the vehicle may be driven and manœuvred by the feet, thus leaving both hands free to fight the machine gun. Formed

into squadrons this vehicle would be charged with the reconnaissance duties previously carried out by cavalry.

The old 40-ton Mark VIII tank, of which 100 were produced in the United States after the Armistice, and which had a speed of only five miles per hour, a crew of twelve, and an armament of two 6-pounders and seven machine guns, has been replaced by a 23-ton tank (Fig. 1), carrying a crew of four at a speed of twelve miles per hour. It mounts one 6-pounder and two machine guns and has an inch of armour.

The new light tank (Fig. 2), has a speed of eighteen miles per hour and a cruising radius of eighty miles. It carries two men, a 37 mm. gun and a .30 inch machine gun. It is noteworthy, in view of our own experiments to produce a universal vehicle for transport and traction as mentioned in *The Times* of 9th April, 1928, that the chassis of this model has been designed to mount cargo bodies so that tenders with oil, petrol, spares, and water can manœuvre along with the tank. The chassis is also capable of mounting a balloon winch, or wire reels for the Signals, and can be adapted as a self-propelled mount for artillery, to mount all manner of equipment, to carry troops, or it may be used simply as a light high speed tractor. One of these chassis fitted as a tank attained a speed of twenty-two miles per hour. In a 420 mile run only one minor repair was necessary, and this occupied twenty minutes. It is noteworthy that this speed is stated to be regarded as a maximum for a vehicle of the track type.

In general, the tank is not yet considered effective at night; it offers a good target, suffers from blindness, and whilst much is expected of it, it is not considered enough in itself. The chemical warfare service is developing smoke producing apparatus for use on tanks, not only to facilitate their own advance but also that of the infantry.

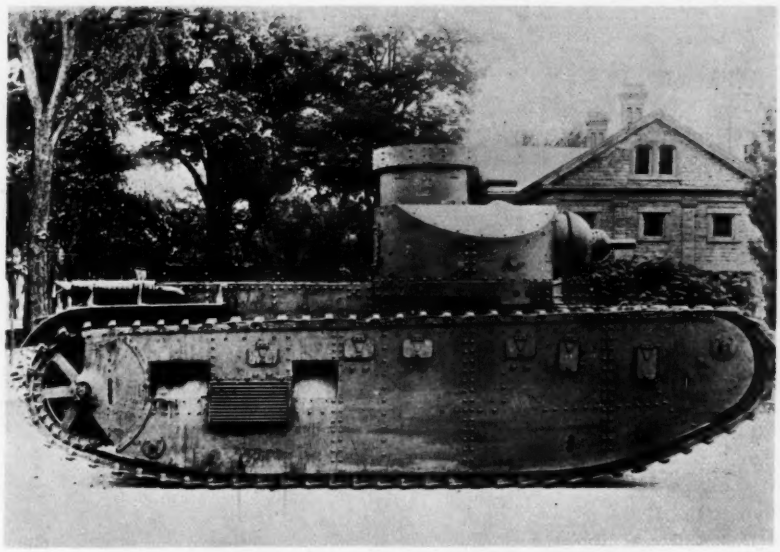


Fig. 1.—U.S. ARMY'S 23-TON TANK

ARMAMENT:—ONE 6 PDR. AND TWO MACHINE GUNS

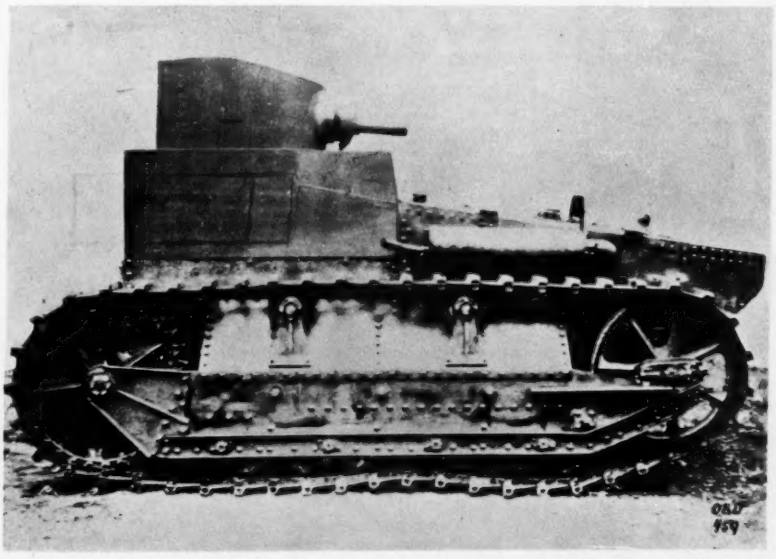
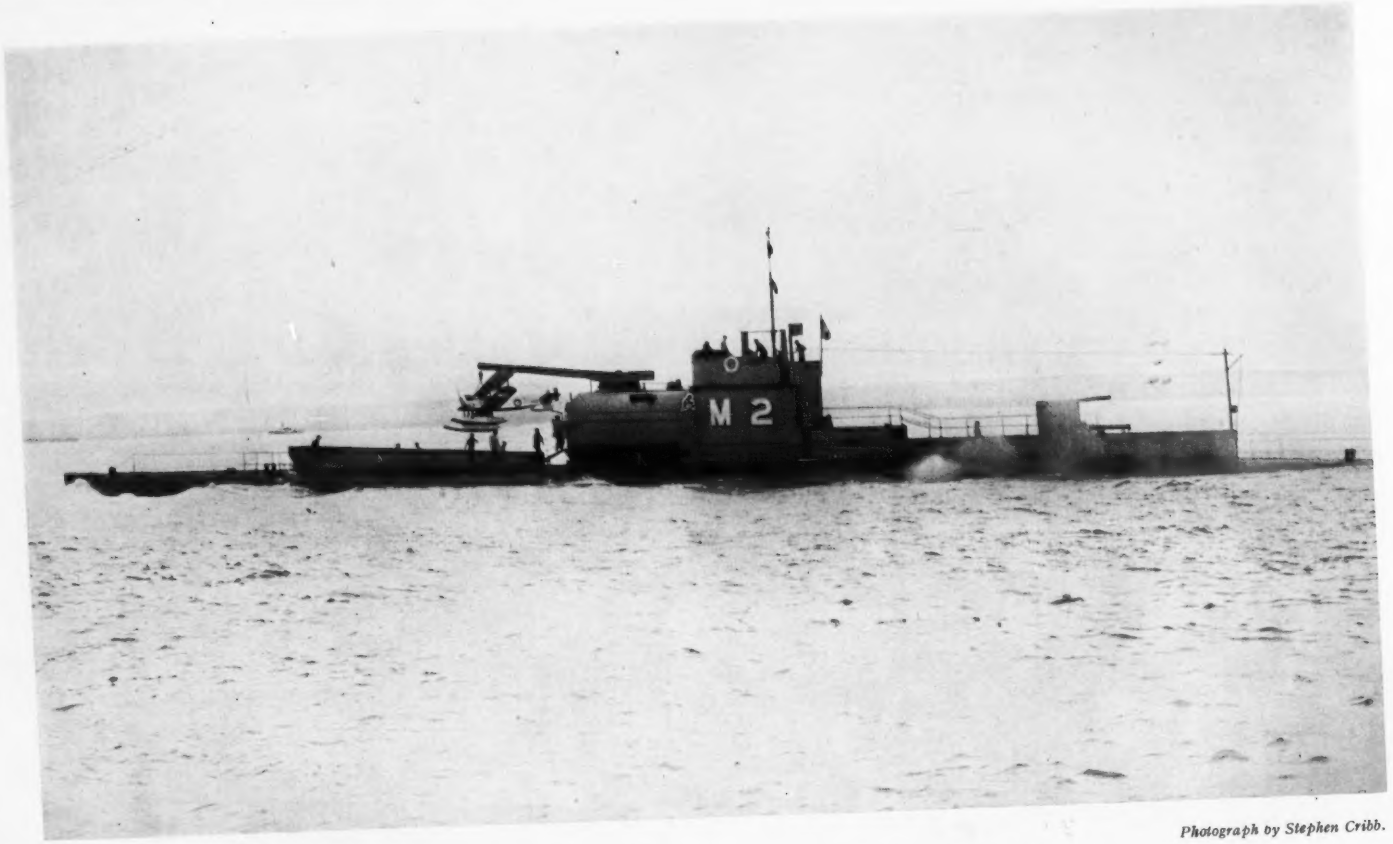


Fig. 2.—THE NEW U.S. ARMY LIGHT TANK

ARMAMENT:—ONE 37 M.M. GUN AND ONE ·30 IN. MACHINE GUN



Photograph by Stephen Cribb.

THE LATEST ADDITION TO THE FLEET AIR ARM.
A SUBMARINE SEAPLANE CARRIER.

AIRCRAFT IN SMALL WARS.

By WING COMMANDER R. H. PECK, O.B.E., R.A.F.

On Wednesday, 1st February, 1928, at 3 p.m.

AIR MARSHAL SIR JOHN SALMOND, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C., Air Officer Commanding-in-Chief Air Defence of Great Britain, in the Chair.

THE CHAIRMAN introduced Wing-Commander Peck, adding that not only did he belong to the Operations Directorate of the Air Ministry, but possessed practical experience of the subject.

LECTURE.

PERHAPS I ought to start in the orthodox way by some definitions; by defining, for instance, what I mean by small wars, or for that matter by aircraft. Anyhow I will venture to make two preliminary remarks.

The first is to say that the views I express are "entirely my own unaided handiwork," and it would certainly be very rash for anyone to infer because of anything I may say, that such is the trend of things, or that it indicates what is in the minds of the "High Flyers." The second of my remarks is this: "Aircraft in small wars" is in some aspects, at any rate, and certainly in those which I shall discuss this afternoon, the subject of prolonged controversy. I take the view that very little profit is to be gained from a lecture which treats the controversial subject in a sort of "safety first" way. I do not think that good co-operation and the solution of important imperial problems are to be attained by the primrose path of mutual admiration. Where what I have to say touches on controversies, I shall therefore try to state one side of the case clearly, and perhaps forcibly, and I may say I hope I shall be provocative.

Do not misunderstand me in that, however, for what I am trying to provoke is not people but thoughts. The mind is a much deeper sleeper to arouse than the man, and if I state one side of the case I do so in order to bring it out in sharper relief; and it does not mean that I do not know well that there is another side to the case and that a strong one.

It is said that it is hard to put small wars into a category. I shall include them in a very broad one and say that by small wars I mean all wars that are fought against wild men, or are fought in wild places. British forces somewhere or other are almost continuously engaged in them. They may be wars against hardy tribesmen or mountaineers who snatch a precarious livelihood amongst the mountain slag heaps of Central Asia. At the other end of the scale I should also include such campaigns as that in East Africa where, if my memory of reading Von Lettow's book is correct, we brought no less than 137 generals against him. The characteristics of such wars (I speak in the main of those against frontier tribesmen) are only too familiar to us all. A very mobile, loosely organised tribal enemy, is able to fight guerilla warfare without lines of communication, to concentrate and disperse rapidly, to escape being brought to battle except at his own chosen moment. They are magnificent shots, possessing little wealth that cannot be moved or secreted. They are fighting in a country they have known since childhood yet imperfectly known to us; a country often of mountain fastnesses and villages nestling snugly in great crevices and folds in the mountain sides and with caves where the very giants of old could have taken refuge, and affording ideal concealment and cover; a country in which hillmen are accustomed to move, and know every path which will take them quickly from place to place, but which is inaccessible to the heavier arms and even the field pieces and to the fighting vehicles and supply train which a civilized army requires. Supply entirely by pack transport is often necessary. The lines of communication are highly vulnerable and may require three men to guard them for every one who is effective at the business end. I take such a country as this because it presents the most difficult type of country for the air to work in. If aircraft can achieve their object there, they can much more easily do so under any other conditions.

We know such warfare places heavy disadvantages on the civilised fighting man, and this we neutralise chiefly by our superior equipment in war machinery. In the main this superiority has consisted in the superiority of the Lee Enfield over the gas pipe. There is also of course the value of superior training in fire discipline and minor tactics. Our difficulties have, however, been very greatly increased of recent years since our wild enemies have become possessed of the long range, accurate, and rapid firing rifle. In some parts of the world, too, they have also received training from us in our own methods of hill fighting.

Our mechanical superiority, though we too have advanced, has not been relatively so great. It has not quite kept pace. The automatic weapon, owing to its heaviness for man-handling in hill country and its heavy consumption of ammunition and the paucity of good targets,

though valuable, by no means possesses the same value that it has in European warfare. The heavier weapons and machines such as the larger artillery and tanks in the same way do not possess a like value in small wars of this particular type.

The two items in which our mechanical improvements have given us means of maintaining our relative advantage over the wild men are the six-wheeled car and aircraft. The six-wheeler will enable us to ease our L. of C. problems and transport heavier items than we could before, while, being easier to protect, it will save man-power on the L. of C. and tonnage for maintenance of that man-power, and will allow us to make shorter pack lifts. The six-wheeler fighting vehicle will be a great asset for certain roles and in certain countries.

But of all our mechanical improvements, and our new armoury of weapons, none has given us anything like so great an advantage, and none is so admirably suited to warfare against wild men and in wild countries, as the aircraft—*provided, of course, it is correctly employed.*

I would like to say at once something on this point of correct employment, because it is so vitally important. Once it has been decided to take air action the Air Commander must be allowed freedom to carry out his operations. Long delays have sometimes and in recent times taken place before permission to take air action has been given, and the whole advantage of the rapidity of air action has been completely thrown away, and the original trouble has spread. On other occasions, when air action has been approved in principle, authority to engage particular targets found has had to be obtained from distant superiors, and even through two or three successive authorities, when the targets found have of course dispersed long before this permission could be obtained. Yet again when air action was succeeding in its effect, the operations have been temporarily suspended with the inevitable result that an enemy preparing to give in has been emboldened to renew his resistance. This sort of vacillation is absolutely crippling to any air operation, entails far more action in the long run, and is ruinous to success. I would urge upon all higher commanders who have occasion to order their Air Officers to carry out air operations to follow the advice so freely offered to the world by Sir Thomas Lipton, that is, to "go to the firm that grows it." Authorise air action, and leave the airman, in conjunction with the political authorities, to carry it out in the way he understands, and without continual reference to remote hierarchs. So much for its correct employment.

The aircraft is a new and highly specialised weapon for which new methods and new tactics are necessary. New wine, new bottles, new weapons, new ways of war. I will try and explain what I mean. It is

the job of the tactician to find out and perfect the best method of using the striking power of the weapon placed at his disposal. The characteristics of any weapon are fixed within certain limits. The methods to use it to the best advantage are not so fixed, but can be, and must be, devised to suit fixed characteristics.

This is a glaring platitude. It always happens, however, that the new weapon is trodden down into the old rut. The weapon is made to subserve existing tactics instead of new tactics evolved which are the most suitable for the new weapon.

The classic instance of this is of course the tanks; it has taken us twelve years to evolve tactics as between infantry and tanks which afford a rôle most suitable to each. The aeroplane has in this respect suffered even more than the tank and is still going through this phase to-day.

So I come back to my point. The aircraft correctly employed is the most remarkable and valuable of all our new mechanical assets. It can be employed in small wars, broadly speaking, in four ways:—

(1) As the only arm which comes into active fighting contact with the enemy, the rôle of the land force being the protection of the air bases.

This is the aspect with which I propose to deal first, and it is of course controversial. If time permits, I will deal afterwards with the other two aspects which are less open to disagreement; and in respect of these I shall endeavour to show the multifarious rôles which aircraft, employed in these other ways, can fill in small wars, and what I think are the conditions and organization which are necessary for their successful working.

(2) As the primary arm to break resistance—rather like a preliminary bombardment—the land forces, after the back of the resistance is broken, going in to clinch the victory. This is a highly valuable and successful way of using aircraft to strengthen the fighting value of irregular forces or native levies or police.

(3) As a contingent co-operating in a secondary rôle with an expeditionary column.

(4) In a variety of ancillary rôles; inter-communication, evacuation of casualties, emergency supply and so on.

To bring out my point best I propose to compare the traditional method we have hitherto employed, that of the expeditionary column, with that which it is my present purpose to advocate, the method of direct air action, the air bases being protected by land forces.

Let us, first of all, be quite clear as to the object that our war, be it expedition or air action, has in view. We desire to exert the minimum force which will restore law and order, cause the minimum of destruction and do as little as possible to increase our difficulties or create animosity—and we wish to incur the least expense.

The moment comes when we are faced with the possibility of having to resort to the heavy expense and trouble of a military expedition. Delays inevitable occur before it is reluctantly accepted that an expedition must be undertaken, and during this time the trouble is spreading. Ultimately orders to prepare an expedition are given and the further delays of preparing it and concentrating it occur. Sometimes, in consequence of the expense, we have tried to take the trick with too small a card, and to send a boy on a man's errand. All this takes time, when what is really wanted, among an inflammable and wild people, is a 'fire-brigade' rapidity of action. The expedition finally starts. With this weapon in our hands, what is our plan for bringing the tribesmen to action and inflicting on them heavy casualties and a sharp lesson? How to achieve this is a problem indeed, since the enemy has a more mobile and less organised force and well knows that his game is the guerilla game; to snipe persistently, contrive ambushes, waylay convoys, try the nerves, cut off stragglers, and wait for inevitable mistakes. Our game is to bring him to action; his game—and, mind you, played in his own country, and on his own ground—is to avoid action. To force him to fight we must enter into his villages and destroy them. We may thus succeed in provoking him so far that he loses his discretion and assembles to be avenged upon us. Our aim is to embitter him; our method, to take away from the poor, from the poorest men in the world, even that which they have: and this although we well know that half their trouble is sheer poverty, and, some of the rest, love of a fight. We must burn his home and his goods and chattels and destroy his roof-tree in order to force him to fight; and if the lesson is to last, it must be severe, so we must kill as many as we can. We are fighting him with his own weapons and though he may be infuriated, still the time and place of battle are largely of his choosing and if we do bring him to action, we must suffer loss ourselves of our own good men.

Often of course this bringing him to action is merely a pious hope; particularly if there has been already instilled into him some knowledge of our methods of hill warfare. We destroy his villages and after that we can do nothing. We are like Napoleon in a burned out Moscow; nothing is to be gained by sitting on the ashes. We cannot remain in occupation. There is nothing left but to cut our way out again with wild men all around us taking what toll they can, and at the end we have laid up for ourselves a legacy of lasting bitterness and still greater

poverty, lives taken, and lives lost, large sums of money uselessly cast away. What sort of war is this, if war be to continue policy by arms? How have we attained our object? We have furnished a grim example of barren destruction, and left hatred and starvation behind us; yet this is what we have been content to go on doing for years and years, and although we now have better weapons and better ways at our disposal, we still have the face to advocate it to-day.

Consider for a moment one other aspect of it, that of cost. The method of the expeditionary column is extremely costly. I want to take an instance from the North West Frontier. In mentioning it I want to make quite clear that I have no desire to engage in any special pleading or propaganda. That is not my present purpose. I instance it simply because the figures which are available abundantly support my argument, so I quote from Lord Ronaldshay's "India—a bird's-eye view." I do not know the basis on which they are calculated, but they are useful just to give a rough idea. On page 99 he says: "There have been more than sixty punitive expeditions during the past three-quarters of a century. The whole aspect of the matter has been completely altered, in recent times, by two factors of paramount importance. The arming of the tribes with modern rifles and the knowledge of fire discipline and modern tactics which they have acquired. Expenditure upon the actual cost of campaigns during the closing twenty years of the century amounted to approximately £300,000. Compare the expenditure during the first twenty years of the present century, £19,500,000, and the nature of the change becomes apparent. Still more significant is the sudden leap in the cost during the past few years. In 1916-1917, we spent £475,000; in 1917-1918, £1,134,000; in 1918-1919 only a little less; in 1920, £16,000,000, which includes the cost of the third Afghan war. Such figures are sufficient in themselves to make it clear that the frontier campaign of to-day is a very serious military operation, requiring very large numbers of troops and equipment of a very high standard. In the old days a force of a few thousand men sufficed. In 1919-1920 it required a force of forty-five thousand fighting men, or with the necessary complement of non-combatants, an army of eighty thousand men in all to deal adequately with Waziristan."

I read elsewhere that there have been no less than seventeen expeditions into Waziristan in the last twenty years, at a cost of nearly twenty million pounds. Twenty million pounds is a big sum to cast away in one of the most barren regions of the world. I know there are many policies forward, backward and neuter, and I do not want to lead away into a discussion about the North-West Frontier. It is small wars that I am here to talk about. The present solution, it appears, is strategic roads to make our expeditions easier and great fortified camps from which

to go out on them. Every penny spent in this way is obviously a penny less for roads, that is, trade roads not strategic roads, and for development. One is told that "Burn and Scuttle" is now abandoned as a policy. But how can we say that? We are simply shifting the same process further out. "Burn and Scuttle" is the very inward nature of this method of sending out expeditions and columns.

Anything which holds out any promise of maintaining the necessary small degree of order more cheaply ought to be tried whenever possible, and the money so saved spent productively. Better trade routes, surveys for productive assets such as minerals or oils, finance on easy terms for railway projects, subsidies for commercial airways. Anything that will enrich our people and enable them better to bear defence burdens, and anything that will develop the country of the tribesmen and enable it better to support its people. The cure of the trouble lies in making the country somehow self-supporting on the one hand, and the process of raiding a less attractive pastime than trading. The more numerous and costly the expeditions, the longer before productive development can make expeditions no longer necessary. The cheaper the form of control the more money for roads and development and the sooner it will be no longer necessary to use armed forces to do with explosives what should be done by policemen with sticks.

Now let us consider for a few moments the other and entirely different method of solving the problem by the employment of aircraft. It is admittedly a difficult problem to solve and the air method undoubtedly involves a very complete change of mind and outlook towards methods of conducting this kind of warfare. Nothing less, in fact, than a revolution in ideas.

Trouble brews up and it finally becomes inevitable that armed force will have to be used. An ultimatum is issued together with a clear and unmistakeable warning that punitive action by air will be taken on its expiry. But there should be no need to waste two months before sending the ultimatum. Action can be taken at once in a country where air units are part of the peace garrison. The action can often be taken from the home station with trifling expense and no delay. Otherwise aircraft and light operating gear for them proceed to advance landing grounds within suitable range of the hostile area. The warning as a rule results in clearing the village of its inhabitants and their removables.

The same thing, of course, is bound to occur when a column enters a village after shelling it. The tribesmen, through their watchers posted on the hills, invariably get some notice of each attack. We do not really mind that. A few aircraft at a time are quite sufficient. A few delay action bombs of varying delay have a good effect. Action sufficiently

accurate to achieve the required purpose can generally be continued by night if necessary. Delay bombs timed to disturb the sleep of the unjust will obviate the need of night flying. Anyone who expects to cause heavy casualties by such a means is of course foredoomed to disappointment, and that is the first point of divergence between the expeditionary methods and those of the airman.

Air action does most definitely neither seek its effects nor secure them by the casualties it inflicts. It therefore takes a certain time, as a blockade would take for its pressure to be felt, for its result to be achieved. It works like a sort of Third Degree by producing an intolerable inconvenience and hardship; an effective dislocation and disruption of normal life and a deprivation of all those customary home comforts which make life worth living or endurable.

The live-stock must all be driven away, and cannot go out freely to normal grazing grounds. They must be fed in caves. The tribesman cannot use his village. Cooking and the preparation of food is fraught with difficulties. When he is sitting down to his meal, his house may be knocked about his ears. The nights on the mountains are chillsome, and caves are cheerless and inconvenient. One is always told that the tribesman retires to some commodious cave, some safe if insalubrious retreat, and makes rude gestures from his rocky security at the aircraft overhead. Do not believe any such fanciful picture. One has only to have seen the London tubes during an air-raid, and for night after night after an air-raid, to know that life in a cave, even to a tribesman, is no high life casino.

Of course he endures it for a while, but as he sees little result for his shooting, he gets unendurably bored with the inconvenience out of which he gets no compensation. Beating the air is a proverbially futile procedure and after a while he is prepared to ask for terms.

Characteristics which I should be prepared to claim on behalf of this method of carrying out this particular type of small war are as follows:

(1) It is more merciful than other forms of warfare in that it does not seek to gain its effect by the infliction of casualties, but by causing intolerable and unprofitable inconvenience. It must be remembered that normally the bombs dropped are quite small and the aircraft loudly proclaim their own advent, but if in some special case casualties are really essential the action to be taken can readily be rendered more severe.

(2) It is immediate and can therefore be applied while the trouble is still on a small scale, and often from peace stations or convenient and accessible advanced landing grounds. As an

instance of that, consider for a moment Iraq which is a country as large as England. If orders there are given in the morning from Headquarters, aircraft from their normal peace stations can be over any part of the country the same day. If it be desired to use one of the usual advanced landing grounds one day, or possibly two days, according to its situation, all that is necessary is to open up an advanced air base for a small but powerful air force and start operations. This is, of course, using air transport as well as light vehicles or the railway. The result is of course that action can be taken at once before the trouble spreads and all can see that the offender is not one to be supported. To no other problem does the " stitch in time " apply with greater force than to the control of the wild man.

(3) While air action takes time to produce effect, it *is* effective; and because it can be turned on again immediately, and without difficulty, its effect is lasting. The tribesman knows it is ever ready. It is sometimes urged that a method which does not inflict casualties cannot be effective. That has been many times shown to be entirely wrong. It is not necessary to kill the patient to cure him. Although very few tribesmen are killed they nevertheless do come in; that is an incontestable fact.

(4) Air action is in a high degree selective and can single out an offending tribe or village. Like a famous remedy " it touches the spot." Here I should like to clear up a misapprehension. One sometimes used to hear that the bomb is an inaccurate missile, " falling from God knows where, and landing on God knows what." The bomb nowadays is very far from inaccurate. I would remind my audience that it took many years for the Navy and Army to learn to shoot. It was only in 1926 that the Royal Air Force at home had for the first time full scale bombing and firing ranges for unit training. Units in Iraq were able to get training somewhat earlier. Sights had to be devised, tried out and put into production; and armament officers and units had to be taught their use. All before training proper could begin. Sights are still improving. Design of aircraft to give more suitable position to the aimer and better co-operation between the aimer and pilot is improving. Aircraft are becoming more answerable to controls and a more stable platform in normal flight than they were, as knowledge of the design of control surfaces, etc., increases. The bomb to-day is a weapon of precision.

(5) Air action does not cause wholesale destruction—unless this be essential. It normally produces its effect without burning villages and turning extreme poverty into utter destitution. If destruction is essential, it can be secured. Bombs can be made, and used, heavier than any shell and with far larger explosive contents. Medium sized bombs which can readily be used in conditions of hill warfare are far more destructive in their effect than any shell which can so be used, but generally speaking there is no need to use large bombs at all.

(6) Very possibly because air action is not very destructive, its employment does not cause animosity among the tribesmen. That this is so, is clear from many enquiries and from the treatment meted out to our prisoners.

(7) The effect of air action is progressive as the nature of the intangible pressure it exerts sinks into the mind of the tribesmen. It always used to be said that the effect was a moral effect and would wear off. The opposite is in fact the truth. The moral effect is very far from being the effect on which we rely to get our results. Familiarity in this case produces the opposite of contempt. That is why the first time the air method is employed it takes time, and why afterwards its action is a good deal quicker, and why the threat of its application is still more effective.

(8) It is cheap to apply. As I have explained, the force which has to be used is simple and small. The fuel and ammunition expended are the principal but trifling expense. As regards the fuel it is of course only the *extra* fuel which counts towards the cost, because, in any case, air units must fly, and fly often or else deteriorate rapidly in quality, and normal annual training requires a good deal of flying.

(9) Air action involves no commitments, no risk of tactical defeat or serious reverse, so that it can be tried with complete safety.

I have endeavoured to show why the air method of carrying out small wars of this type is most advantageous and that in many such wars it will most certainly succeed in a shorter total time and at a vastly less cost than that of other methods in achieving its object

Wherever it has been tried, it has succeeded. The jobs which it has been allowed to do it has done effectively. One often hears the contention put forward that, of course, its astonishing success in Iraq cannot really be used as an argument that it will succeed anywhere else. One is told some peculiar quality about the country or the tribesmen or

what not has enabled aircraft to achieve in Iraq what they could not achieve anywhere else. That is, of course, an absurd contention. One recalls that in earlier days it was said that aircraft could not possibly succeed in Iraq.

It has been tried in a few instances in India. I will refer to two:

In Waziristan in 1925 against certain sections of Mahsuds; and again in 1927 in some minor operations against the Mohmands.

The views given respectively by airmen and soldiers as to the precise circumstances, strength, importance and fighting spirit of the tribes and lashkars dealt with, the intensity of their hostility and so on, are as might be expected somewhat divergent. The airman takes the view that the tribes that we dealt with would have been a very nasty and expensive nut to crack by any other means and that they were promptly, properly and cheaply cracked from the air. The soldiers take the view that the tribes were small, not very hostile, were influenced to come in by other considerations than air action and so on.

Two facts, however, seem to me to stand out. In the operations against the Mahsuds in 1925, the section dealt with, the Abdur Rahman Khel, was still standing out after operations carried out intermittently against that tribe during the previous four years. They were a small section possibly; the rest of their tribe had come in, no doubt; but *they* could *not* be induced to do so. Yet these staunch diehards gave in after a few weeks' air action, even though carried out under difficult conditions. The casualties inflicted in achieving this result were trifling, thus showing once again that it is not the casualties which bring about the submission.

As regards the operations against the Mohmands, a very similar affair in 1908, had caused us considerable trouble to deal with it. This time, however, without one shot or shell being fired except from the air, it fizzled out in four days like a damp squib. The troops took up positions suitable to bar the advance of the lashkars. The lashkar was quite obviously not to be caught with any such chaff and stayed on ground where it could not be got at except under conditions very unfavourable for our troops. This impasse was, in spite of delays and difficulties, references to distant authorities and so on, cleared up the moment aircraft could be released to get at them; and after one or two attacks, causing minor casualties only, the tribesmen abandoned the whole enterprise. Once they saw they could be got at, the game was up.

It is all rather like the very old story of Columbus. First, Columbus was told he could not succeed, then in any case he was not going to be allowed to try. After he had succeeded, well, it was quite

easy anyway, and anyone could have done it. And you will remember how he confronted the nobles with the problem of standing the egg on its end, and how, when they had tried and failed, he cut the base of the egg and stood it up. "Anyone could have done it," they said. "Perhaps," he answered, "but I did it."

I am not concerned at the moment to show whether the tribes here or there were great or small, and some particular operation otherwise simple or difficult. My point is that we have been given certain operations to do, and certainly under some difficulties, difficulties caused by delays, undue necessity for reference to higher commanders, stopping of operations half way through, old types of aircraft and so on; but they were done successfully. All we claim is that the air method has much to recommend it; that whenever it has been tried it has been successful; that it ought to be used more often and whenever possible; and that when it *is* used, it should be used correctly. When a little war comes up, ask us if we can do it and what our plan would entail. That is all we ask, and I feel that we have established our claim to try.

One thing more. I have endeavoured to state the case for using air action whenever possible in small wars, tribal wars. Possibly this method, which has proved itself successful in small tribal wars, might be applied to other wars, to some of the larger wars, that take place in wild places. When the next small war on this larger scale comes along do not let us rush into it headlong by the old methods and send great expeditions of eighty thousand men shooting away hundreds of thousands of pounds. Let us see if the air method cannot be applied here also, and ask us to put forward a plan.

DISCUSSION.

The North-West Frontier Problem.

Colonel Rowan Robinson: All officers who have served on the North-West Frontier have a tremendous admiration for the achievements of the Royal Air Force in India, and I should be very sorry indeed to say anything which would tend to belittle their efforts.

Marshal Foch in his books very often suggests to his readers that, when they have any particular problem to solve, they should put to themselves the question: "*De quoi s'agit il?*"—what is the problem? I suggest that when we are discussing a question, whether it is an air, a soldier, or combined question, that we should take his advice and look at it not from the point of view of the airman or of the soldier or of the sailor, but from the general point of view. The lecturer has laid particular stress on the Indian problem, naturally because that is the greatest small war problem in the British Empire. The problem is to control the tribes of the Indian Frontier. Why? Because they are always giving us trouble in peace-time, and because we want to secure our communications behind us if we go to war beyond the Indian Frontier. The tribes live in barren mountains,

and, in order to live, have to raid the rich plains. We have, therefore, not only to exercise a military control over them, but also to solve their economic problem. The solution that the lecturer suggests is that the airman shall go to those countries and shall bomb them. He says he will not inflict many casualties on the people, that he will not create great animosity, and that he will bring them to book. He says that bombing is a cheap method. I suggest that the cheapest way is not necessarily the best way. The lecturer suggested that no animosity was left behind. That, I think, is a matter of opinion which we cannot argue. The tribesman who has managed to conceal himself in the woods perhaps has his wife and children killed. That is the sort of thing that may occur both in regard to the Army and the Air Force, so that this question of animosity applies to either of them. Therefore, I do not think we can expect that any pleasant feeling will remain whether the people are bombed by the Air Force or shot by soldiers. I cordially agree with the remarks the lecturer made on the subject of the ordinary frontier expeditions. They go in to a country and they come out, leaving a legacy of hatred. That policy was given up by Lord Rawlinson when he went to India. He initiated the policy of establishing troops in the heart of a country, building roads and dominating the tribes—which has been entirely successful where it has been applied. A force has been at Razmak now since 1923, and since that time there has been practically no trouble whatever with the Mahsuds and the Wazirs, the two most difficult tribes on the frontier. I suggest that, if we want to spend money in really controlling the tribes, that is the way it should be done, because, apart from military control, the construction of roads opens up the country. The lecturer said that these roads are only strategic. I disagree there. We made the road up the Tochi Valley; we made a road up to Razmak, which is in the heart of the Mahsud country. It has been our plan to drive the roads near to where the population is greatest. If anyone who saw Waziristan before the initiation of the new policy could see it now, he would realize the enormous difference it has made. The Mahsuds, the worst of our enemies, have now taken to trading and selling motor cars instead of shooting us. This policy, moreover, also solves the problem of protecting our lines of communication when there is a big war, which can be done neither by the airman nor the soldier by the method of tip and run.

Effects of Air Action.

Colonel Howard: The impression I obtained from the lecture is that the lecturer thinks that the value of aircraft in dealing with tribesmen in small wars is not fully appreciated. I think that there he is wrong. In the Army it is very much appreciated. During the thirty-five years that I have served I have seen some service in small wars, both without aircraft and also, Sir, with you in 1923 in Kurdistan in co-operation with aircraft, and, generally speaking, I agree cordially with what Wing-Commander Peck has said. But there is one statement he made which, to my mind, is a fallacy, and that is that action by aircraft will force tribesmen to battle. To my mind exactly the opposite occurs; it terrifies and disperses them. If the object is to bring tribesmen to battle against the great fire power of ground troops, in my opinion action by aircraft should not take place previous to the attack by or on ground troops. If aircraft can do the work entirely on their own and produce decisive results, which they can in many cases, let them do so; but if it is thought that they cannot by themselves produce decisive results, it is, in my opinion, wrong to take air action (except of course reconnaissance) *before* attacking with ground troops. The main object is to obtain

a *decisive* result. By attacking with ground troops tribesmen get a very severe blow. They are knocked out and decisive results are achieved.

CAPTAIN C. T. BECKETT: I should like the lecturer to amplify his remarks with regard to the difference between Trade Roads and Strategic Roads, a matter upon which Colonel Rowan Robinson has already touched.

I suggest that in countries such as he has described, in fact in most natures of terrain, such roads are identical and follow the lines of least geographical resistance, when such a country is being developed either peaceably or by invasion. The action proposed by the lecturer would seem to deprive us entirely of the advantages of such roads, unless such roads are to be constructed under the protection of the bombing raids when I fear that the tribesmen might relieve their boredom at the expense of the road-makers!

Incidentally, if boredom is the humane object of these raids further research for a more accurate bomb sight would seem to be unnecessary. But I would also ask the lecturer if it is not the moral effect of a new and strange gun which is really the decisive factor?

I seem to remember that the Spaniards conquered Mexico almost bloodlessly (much as the lecturer suggests that we should conquer similar people and countries) by reason of the moral effect of, to them, unknown gunpowder and armour. This effect, however, soon wore off and two hundred years of trouble supervened. Is it not possible that a similar cause and effect may operate if the lecturer's plans were followed and leave us, whatever the initial success, with the necessity of occupying by force with ground troops the territory so easily gained initially?

RIVER WARFARE AND ITS LESSONS.

CAPTAIN E. ALTHAM: As I happen to be one of the very few naval officers who have had the privilege of using aircraft in a small war, perhaps my experience in North Russia in 1919 be may of some interest.

First let me try and give you a picture of the situation. I want you to imagine a wide, winding river not unlike the lower reaches of the Thames; on either bank the rival military forces, facing each other; our own, mixed with so-called White Russians; and the Bolsheviks in opposition; on the river our flotilla of gunboats, small monitors, depot and water-transport vessels and small craft, and the attached seaplanes. A little way up river, in a narrow reach, the fairway was blocked with mines. Above that again, lay the Bolshevik flotilla, armed with modern long-range guns. From time to time the enemy used to indulge in tip and run tactics. A gunboat would dash down river to the edge of their minefield and bombard the shore right and left or fire into our flotilla anchorage. We used to keep a gunboat as far up on our side of the minefield as we could to counter these bombardments, but owing to the winding nature of the river, it was very difficult to reply effectively and at first these attacks were extremely uncomfortable.

Fortunately, we had the Royal Air Force and their seaplanes attached to the flotilla; also we had an advanced observation position on the bank; and on each occasion when the enemy indulged in one of his tip and run attacks, the latter were able to pick out the actual gunboat which fired. She, of course, ran back afterwards and buried herself among the rest of her flotilla; but our naval observers ashore communicated her description to me and I used to pass this on to my Wing Commander who always kept two or three seaplanes ready with bombs. The pilots were soon able to pick out the right gunboat and within half an hour she was run to earth and well bombed. It proved a most effective method

of dealing with that particular form of attack, in fact, as the lecturer put it, it "touched the spot."

Such incidents may be of historical interest, but to quote history without drawing some conclusion is, to my mind of doubtful value. The conclusion I formed, after very considerable experience in the use of aircraft in a small war of the nature I have described, was that although we, the Army and Navy, on the ground level, would have been very badly off without the co-operation of the forces of the air; yet, equally, I think neither of the two "ground level" forces could have been replaced by air forces without sorely missing their partners afloat or ashore. All three Services had to co-operate; we each had to fit into our own particular niche.

My own view is that in small wars and in great wars the Royal Air Force will continue to be the long range *hitting* force, but the "ground level" forces—the Army and the Navy—must, in their respective elements, continue to be the *holding* and the *consolidating* forces.

LECTURER'S REPLY.

WING COMMANDER R. H. PECK, in reply: I would like to say a little more on the question whether more or less animosity is raised by air action or by an expedition. It is a matter on which two opinions may be held, but it seems to me clear that since air action gains its effect mostly by producing intolerable tedium and discomfort but with fewer casualties and less destruction it is bound to arouse less animosity than a method which causes far more wide-spread destruction and far heavier casualties.

A point has cropped up to-day which touches on this question of animosity. When a bomb falls it seems to be assumed that it is the wife and child who get hit. I really cannot see why an air bomb should be thought to have inherently some sort of fatal attraction towards the fair sex. I do not see why when a shell falls it should be assumed that it hits a soldier or tribesman, but when a bomb falls it singles out his wife and child. At other times one is told the bomb does not hit anything at all! Both suggestions are equally fallacious.

As regards strategic routes or trade routes, we are told that the new policy of building military roads and camps is preferable to air control. I disagree. Many of the roads now being built do not follow trade routes at all and are strategic. Their object is to make the same military expeditions easier. Road making and expeditions are not necessarily combined. There is a certain total sum of money available. The more of it which is spent on camps and strategic roads and costly expeditions the less left for trade roads and productive development. I think that we should control as cheaply as possible, that is to say by aircraft, and thus have the greatest possible part of the total money for productive expenditure. The less spent in control the more saved for trade roads and development.

As regards moral effect, I believed when I first went to Iraq that the results of air action were in the main moral and would wear off and bombs would then have to be larger and be more frequently dropped. I was wrong. The opposite is the fact. The first time air action is taken the tribe fires vigorously up at the aircraft and puts up a fight, but afterwards it does not. Air action starts with a small moral effect, but this sinks in and the tribesman comes to realise that the hardships it can produce are a serious matter for him and not to be regarded lightly.

THE CHAIRMAN.

There are just one or two points I would like to touch upon. A good deal has been said about aircraft in respect to the North-West Frontier, and a good deal also in that connection with regard to roads. I believe we are all agreed that the solution for the North-West Frontier problem is civilisation, and it is only a matter of how that civilisation can be got there. I do not think personally that aircraft could claim at any time to be able to put that country in such a state that you could civilise it and build roads. The Army is doing it by the Razmak policy about which Colonel Rowan Robinson has told us. They are doing it at the expense of troops and expeditions and at a very great financial outlay. If there had been no question of having to civilise in order to cure this evil on the North-West Frontier, then it is my opinion that we could have kept, given sufficient aircraft, that North-West Frontier under a certain degree of pressure which would have obviated their continually raiding into the plains. It really comes to a question of finance. If there was no question of finance, then you can put your Army in and you can build your roads, but so long as we are under the present stringent financial conditions we cannot build more roads in other parts of the world, because we have not got the money; and under those conditions we claim that the Air Force can keep these places under sufficient control so as to stop raiding and all the other ills that these wild tribes perpetrate. When there is a case for air action it seems to me there is only one side to the question, and there are cases even now on the North-West Frontier that can be treated from the aerodromes that are within the frontier or outside the frontier. When such a case arises there is no doubt the air ought to be used; I think all will agree to that. What the lecturer has emphasised to-day is that they should be given a fair chance. An absolute necessity for the successful use of aircraft is speed in operation. The lecturer laid great emphasis on the fact that once an air operation has been decided upon by the Higher Command, the Air Officer responsible for the operation should be given as free a hand as possible. I heartily concur and would add that the usual stereotyped channel for orders is too cumbersome. If air action has to be taken at all, it must be taken quickly and in addition there must be a very complete intelligence system to work upon. So long as it is done at once and can be maintained, then your action is successful. But we do not claim to be able to fly over great tracts of country and to civilise them. That, to my mind, is out of the question. The lecturer instanced two occasions recently when air action has been entirely successful. I would also like to add this—In 1922 I had to go out to India to make a report on the Air Force. I visited the frontier and I had very many discussions with the then Commander-in-Chief, Lord Rawlinson. Finally, when I reported what action, in my opinion, the Royal Air Force could successfully undertake, he said: "You go to Iraq and try it there. If it succeeds I will do it here." It was done there successfully and it has been done in India since, and it has proved successful when it has been tried. All we say is: "Try us under the circumstances when we are required," and, as the lecturer has put it, we will "deliver the goods."

The customary votes of thanks to the Chairman and to the Lecturer brought the proceedings to a conclusion.

MECHANIZED TRANSPORT IN SMALL WARS

By LIEUTENANT-COLONEL G. C. G. BLUNT, D.S.O., O.B.E., R.A.S.C.

ALREADY before the Armistice a mass of invaluable information had been collected concerning the employment of all types of mechanical transport vehicles in each of the several theatres of war. It referred to the relative value of white and coloured M.T. personnel, to the effect of climatic and local conditions on the British personnel, to the general lay out, organization and management of the various types of repair and M.T. Stores Depots, and to many other matters connected with the operation, maintenance and upkeep of the 164,300 self-propelled vehicles which, at the Armistice, were in service in overseas theatres and at home. Many of these lessons, learnt by the hard experience of active service, are as useful and true to-day as they were in 1918.

In view of the post-war development and progress of mechanization, a particular interest is attached to the employment of self-propelled vehicles and their personnel in tropical and semi-tropical climates. It is, therefore, proposed to study a few of the more important conclusions that have been formulated from war time records amplifying these with lessons which suggest themselves for consideration in any future campaign in such countries.

I.—BRITISH PERSONNEL.

(1) MESOPOTAMIA.—The majority of British other ranks composing drafts from England found their way into hospital within a comparatively short time of their arrival, and with periodic sickness, it was not possible to rely on even those classified as physically fit to be effective for more than a comparatively few months at a time.

Generally speaking, an increase of 40% to 50% over similar establishments for Western European fronts is necessary in the case of M.T. units operating in Mesopotamia to allow for men in hospital, excused duty, inoculations and those on leave out of the country.

(2) SALONIKA.—Owing to the heavy gradients and precipitous winding descents over rough roads, which, in some areas (particularly where the Serbian M.T. Units were operating), were mere tracks demanding

exceptional skill in driving and physical stamina, only "A" Category men were found really suitable for the work, except in the Base Area. Nowhere in the Force could the employment of "B" and "C" Category men be pronounced a success, as they constantly suffered from sickness —malaria, sandfly fever, dysentery—and were therefore a constant burden on the medical resources of the Force.

If an adequate supply of "A" Category men could be maintained, no lower class should be used for M.T. work in this country.

(3) German East Africa.—The casualties amongst all ranks of Europeans due to climatic conditions, were very heavy, rendering on an average of about 50% of the European drivers and artificers non-effective. On the whole, the men of middle age were more immune from climatic sickness, and experience served to show that men under twenty-eight years of age were lacking in stamina, and that all men for tropical service should be of the highest physical standard.

On one particularly unhealthy line of advance, the monthly casualties exceeded the strength of the personnel employed, the non-effectives representing a temporary wastage of over one hundred per cent per month.

This meant that, if reserves of M.T. drivers were not adequate, the whole organization would be in danger of breakdown.

Cases existed, in fact, on the Kilwa line, when vehicles were standing idle for long periods for lack of drivers, and in an endeavour to meet the situation as far as possible, every staff car driver was transferred to the supply columns as lorry drivers, the officers affected being instructed, either to act as their own drivers or hire rickshaws.

Further, on more than one occasion during this campaign, operations designed by the General Staff had to be postponed owing to sickness and casualties amongst the M.T. drivers of supply and ammunition columns.

(4) Egypt and Palestine.—In view of the tactical situation and difficulties of road transport in Palestine, it was decided not to substitute "A" Class by "B" Class M.T. personnel, owing to the danger of jeopardizing the maintenance of the troops operating at a considerable distance from railhead, who could only be reached by M.T. Even for personnel of first class condition, the climate of Palestine is extremely trying, both during the summer when the heat is intense, often accompanied by great humidity, and during the winter months, when the tropical heat of summer suddenly drops to a temperature approaching freezing point.

Many of the roads and tracks wind across the desert, hard and soft sand, over roads covered with loose stones, through mud and along the edges of precipices, as for instance in the mountainous country about Jerusalem and Jericho. The gradients are very steep, and roads narrow and with a great number of hairpin bends.

Driving self-propelled vehicles, particularly lorries and tractors, over such roads involves a continual strain, and for months on end, the actual driving hours were often twelve or more hours per day, apart from the time occupied in greasing and cleaning. This calls for powers of exceptional endurance, and unless the drivers are men of sound health, they will very soon break down and become casualties.

(5) HOME M.T. REINFORCEMENT DEPOTS.—The difficulties in obtaining skilled men were considerably added to when M.T. men of high medical category were withdrawn for transfer to the Infantry. This decision meant the loss of some 60,000 skilled drivers and artificers, including 30,000 at home alone, all of whom had to be replaced by men less skilled and of lower medical category, the loss of whom was sufficient to have a marked effect on the efficiency of the M.T. in the Field.

The abstraction of this great number of skilled men from a Service which was already becoming unduly depleted of skilled drivers and artificers was reflected by heavy multiplication of accidents and the inevitable abuse of the valuable mechanism of the vehicles. The serious financial loss directly involved cannot be actually gauged, but it was reflected in the condition of the vehicles, and also in the increased requirements of spare parts from motor manufacturing establishments and munition depots at home, and in the increased strain on repairing facilities in all theatres.

It was also reflected in the increased evacuation of personnel, the number of evacuations bearing out the little realized fact that lorry driving imposed considerable strain, both physical and mental, especially in the forward areas or under great and prolonged pressure of work.

Although skilled men of lower category were eventually drafted to bases, L. of C. areas and the United Kingdom, where the work was of a more regular nature, and conditions less arduous, the fact remains that the increasing age of the vehicles and the less amount of skilled handling, which they received, undoubtedly had a detrimental effect on the whole problem of the operation, maintenance and repair of the vehicles in service, and in the provision of spare parts and M.T. Stores required in their upkeep.

In this connection it is interesting from the economic, industrial and man-power aspect to look at the value of the M.T. Stores, comprising

spare parts, tyres and materials which were purchased between 1915 and 1918 by the Home M.T. Depot :

1915	£4,625,994
1916	4,651,951
1917	8,921,233
1918	12,554,142
Total	£30,753,320

Considerable physical energy is required of those employed in driving self-propelled vehicles over difficult and broken country under a tropical sun with but little daily rest, even when active mobile operations may have temporarily ceased. Though their daily task is not so dangerous as that of the fighting soldier, yet their work in the forward areas is far from being so easy as is commonly imagined. Moreover, since the maintenance services, the conveyance of munitions, food and stores beyond railhead, are likely to be the special objective of hostile aircraft, it is more than ever important that the personnel of mechanized transport should be of high medical category in order to withstand the nervous strain to which they may be subjected.

Further, it is evident that : (*a*) the percentage of reinforcements kept in reserve at the Base to replace casualties amongst drivers of self-propelled vehicles of all arms should in tropical theatres be considerably greater than has hitherto been laid down in establishments ; (*b*) except at the Base and on the L. of C., wastage or shortage in motor drivers should not be made up by the employment of men, who are unfit for " general duties " in the forward areas.

II.—Personnel—Other Nationalities.

Owing to the increasing shortage of British personnel already described, it was found necessary to establish M.T. Schools of Instruction for the purpose of teaching natives to drive motor vehicles in each theatre of war. In all of these, several thousand natives of many different nationalities, were employed. On more than one occasion, without such supplementary assistance, the maintenance of the fighting troops would undoubtedly have broken down.

To establish these M.T. Schools of Instruction, selected officers, N.C.O's and men had to be withdrawn from R.A.S.C. units in the field to form the required personnel and staff, though subsequently in most overseas theatres, proper establishments were authorized for testing and training both European and native drivers and artificers.

(1) MESOPOTAMIA.—Some 4,000 natives, Arabs, Armenians, Burmese and Indians were employed as drivers; and Arabs, Chinese and Burmese as artificers.

Asiatic artificers, although classed as skilled in various trades, do not attain to British standards, owing to their lack of education and initiative. When, however, they are placed to work alongside a British artificer, who can supervise them, they are satisfactory, and take a keen interest in their work, but can only be regarded as, say, "fitters' mates."

As regards Asiatic drivers, the Burmese made excellent drivers, were very keen on their vehicles, and in carrying out any instructions received.

The castes found most suitable were Karens, Falaings and Shans. Arabs also make competent drivers, but take longer to train.

(2) SALONIKA.—Russians, Greeks and Maltese were employed. The Maltese proved to be of very poor quality as M.T. drivers. No amount of training could bring them to the desired degree of efficiency. They were mostly under-developed, very short in stature, lacked confidence, and proved unreliable in emergencies. On the other hand, they did quite well on ordinary unskilled general duties in standing camps and at the Base.

Greeks were found most suitable as wheelers and tinsmiths, after comparatively little training.

(3) EAST AFRICA.—The M.T. native personnel in this theatre was very cosmopolitan in character, consisting as it did of Indians, Malays, Chinese, Seychelles Islanders, Cingalese, and East and West African natives.

A certain amount of mixing of white and native personnel took place with unsatisfactory results. It was found that the grouping together of European and natives on the same duties is very undesirable, as tending to destroy the prestige of the European, lessen his control over the native, and make the native too assertive. The fact that the coloured man (Chinese, Indians and West Africans) in many cases was receiving in this theatre much higher rates of pay than the European R.A.S.C. driver, did not make matters easier.

(4) PALESTINE.—Egyptians, Sudanese, Greeks, Armenians and Jews were employed with the M.T. in this theatre.

From a transport point of view, it was found that the Egyptian lacked initiative, had no idea of speed or of judgment in relation to other objects. He also had little or no road sense and self-confidence. If he gets into an awkward position whilst driving, he nearly always

lost his head, with the result that numerous accidents occurred, and a large number of vehicles were badly damaged.

Generally speaking, the employment of native drivers, and, to a similar extent, native artificers, is quite a feasible proposition. In all our Crown Colonies and Protectorates, native drivers are almost universally employed, both by the Governments and commercial firms, under the general supervision, where possible, of Europeans. It is, however, essential that such natives receive careful and proper training, otherwise the cost of the upkeep and maintenance of the vehicles they drive becomes unduly increased, and the base and mobile workshops are in consequence overburdened with repair work.

Seeing therefore that native driving schools had to be formed in every theatre of war, it is urged that in any future campaign in a tropical or unhealthy country, the earliest steps should be taken to establish one of these driving schools, where natives and other personnel can be taught to drive and be trained to give semi-skilled assistance to European personnel in the Base and other L. of C., repair workshops.

III.—Reinforcements.

On the arrival of an Expeditionary Force in such a theatre of war, the mechanized first line transport and the load carrying vehicles belonging to R.A., R.E., Tank Corps and other technical and fighting units will, under present conditions, be driven by personnel of those arms. Nevertheless, in the event of a shortage of reinforcement drivers occurring, it may be necessary to redistribute the driving personnel of all units equipped with self-propelled vehicles, in order that the more forward units may retain the available British drivers, the base and L. of C. Units being diluted by trained native drivers. Under such circumstances it appears that there may be some difficulty in retaining the regimental identity not only of men so transferred, but also of the locally trained and other personnel, who would presumably be drafted, after training at the Base, to any arm of the Service in need of driving personnel.

This is a problem requiring thought, for once the Infantry "first line reinforcements at the base" have been absorbed, it will no longer be possible to maintain a regular flow of "trained regimental" drivers, unless Infantry recruits are required to possess previous knowledge of driving motor vehicles, or are to be drawn from a general reinforcement driving school.

The supply of further motor drivers to replace casualties in the field of first line transport must surely come from one common source!

IV.—Field Mobile and Base Workshops—Artificers.

(1) East Africa.—The extreme heat proved most enervating, reducing a man's capacity for physical exertion in a marked degree, added to which a man employed at hard manual work was liable to heat stroke. Working in high temperatures caused excessive thirst and a lack of normal appetite, hence the men were prone to drink large quantities of water, and at the same time to take insufficient food.

These remarks apply with greatest force to the workshop personnel. Where properly protected and ventilated shops were not available, the expedient of working by night instead of by day was tried, and adopted with success. It was found that the men could work longer hours, and, given adequate artificial lighting, their output was greater per unit of time and they were more immune from sickness.

The hours of work adopted in areas varied, but ranged between 0600 to 1100 hours, and between 1700 to 2300 hours.

(2) Mesopotamia.—For the purpose of sheltering the workshop artificers, a light collapsible shed, made of steel framework or light material, covered with canvas, and sufficiently large to accommodate four 3-ton lorries, should be issued for every hundred vehicles on charge, whilst accommodation of the blacksmiths and another for the wheelers should also be provided.

(3) Italy.—In drawing up the specification of a Field Workshop, some provision must be made to protect the artificer personnel from the weather, since the presence of suitable accommodation cannot be taken for granted.

Moreover, if a workshop officer is fortunate enough to get a barn or stable to house his artificers, the chances are that almost as much labour is involved in making the accommodation fit to work in as to erect a covering. As a result, almost every workshop officer found it necessary to make some form of structure which, having been built up from such inadequate material as he could obtain from the R.E. or the R.A.O.D., was not of the most suitable character, nor could any uniformity of design be followed. Moreover, these materials were often too bulky.

It is therefore essential and should be possible to design a form of covering, constructed of light steel tubing, trussed and capable of supporting one or more large tarpaulins stretched between the several workshops and store lorry bodies, so providing a weather-proof roof under which the various artificers can work.

At no time can the whole of the workshop artificers (fitters, turners, electricians, wheelers, trimmers, coppersmiths and others), find sufficient space to work within the body of even the largest type of mobile work-

shop yet designed, and without proper protection from the weather for those who are employed in carrying out light repairs and adjustments on the engine or chassis of a vehicle requiring workshop attention, not only is the efficiency of the work affected, but also the health of the artificer personnel.

Side curtains are also necessary for those working on the ground, as a protection against rain, tropical sun, wind, dust and sand.

Some provision must be made to give the artificer proper shelter to work under during inclement weather or under a tropical sun, and the increase of one or even two vehicles to each repair and workshop Field Unit for the purpose of carrying such a light portable and easily erected shelter might be well repaid, by the improvement in maintenance repairs, and by better health and less sickness amongst the workshop personnel.

The heavy and medium type six-wheeled chassis with long wheelbase should provide the required type of vehicle, giving the necessary additional space for the machine tools and for the fitters and turners to work in. But, however large the body of the workshop vehicle may be, an outside shelter will still be required for the blacksmiths, wheelers and other artificers, who require so much " elbow room," whilst separate covered shelter will also be necessary for the vulcanizing personnel, who, in these days of pneumatic tyred vehicles, are likely to be increasingly busy.

V.—Shipment and Stowage of Vehicles and Stores.

Vehicles were considerably damaged in transit from home, and the losses of tools and equipment were very considerable. Damage caused by careless slinging and stowage of a motor vehicle at the port of embarkation would put that vehicle out of action for a long time on arrival in an overseas theatre, before it could be classified as fit and serviceable for issue. Further, it was not only the financial loss which mattered, but the fact that such equipment might not be immediately replaceable overseas, which the vehicle deficient therein suffered accordingly.

Equipment should always be removed and packed separately, and in the case of pneumatic tyres, these should be stowed in an upright position, i.e., on the tread, since, when stowed in columns on the flat, the beading of the lower ones will invariably be damaged. On the other hand, solid tyres should, owing to the liability of distorting the inner steel band, be stowed on the flat, and not upright on the tread.

The preparation for shipment immediately prior to embarkation, the hoisting, stowage 'tween decks or elsewhere, and the disembarkation of every costly self-propelled motor vehicle requires the greatest care and supervision on the part of the staff and quayside personnel.

Consequently, the personnel at each port of embarkation should include selected technical representatives of Mechanized Corps and should be adequate to deal with the shipment of large numbers of vehicles in several ships at one and the same time.

The shipment of M.T. vehicles and stores will be an operation of no small importance in the case of a mechanized or partly mechanized Expeditionary Force, and the greatest care must therefore be exercised in the handling of such equipment.

VI.—Retrieving and Salvage Overseas Workshops.

(1) Mesopotamia.—The "Retrieving and Salvage" Section of the M.T. Depot at Baghdad was opened on the 1st June, 1918.

The total amount reclaimed for the period June to the end of September was £8,874, and from October to the 31st December, £17,169, making a gross total of £26,043. Of this total, £8,000 represented the value of the covers and tubes reclaimed. Although the value in money was enormous, the greatest benefit was in actual material. For months, owing to lack of new spare parts, this retrieving section was practically the only source of supply of spare parts and materials for the Base Heavy Repair Workshops.

In practically all instances, the parts or material returned by Units or by Field Mobile Workshops were beyond repair, whereas at the Retrieving Depot, with first class workmanship and highly skilled artificers, reclamation was possible. To quote only one instance: when it was found impossible to obtain new Ford axle shafts, or the material from which to make them, from the M.T. Stores Depot, the Retrieving and Salvage Section supplied three hundred feet of chrome nickel steel reclaimed from old axles of other types of vehicles to the Advanced M.T. Workshops for conversion to Ford axle shafts.

This salving and retrieving of spare parts not only cut down considerably the demands on the Home M.T. Depot for such equipment and other stores, but incidentally helped to reduce the shipping requirements from Home to the overseas depot.

(2) Salonika.—Up to the Armistice, the quantity of stores salved, retrieved, repaired and put into use again in this theatre represented the value of £32,250, at half catalogue prices.

The total output of repaired and reclaimed tyres was approximately 13,200 covers and 20,000 tubes.

Several thousand springs for all types of vehicles had to be reset, retempered or rebuilt from broken and partworn springs, owing to the lack of springs from the Home Depot, and to the very rough nature of the roads in this theatre. In the electricians' section, some 6,000 sparking

plugs, 600 accumulators and 2,000 magnetos and lighting sets were reclaimed.

(3) EGYPT.—The value of the spare parts and M.T. stores rendered serviceable in the Retrieving Depot of the M.T. Workshops at Alexandria amounted to £12,692 for 1918.

The retrieving of partworn spare parts and equipment is not carried out on such an extensive scale in peace time, nor, it is understood, does such an organization figure in the War Establishments. Yet the proof of its necessity is obvious, since the damage and wastage of vehicle equipment on active service is very considerable, due to a great extent, to the fact that vehicles are always parked in the open completely unprotected from the weather. During the Great War this necessity compelled the taking of measure to repair all worn spare parts, in order that the shortage due to sinking of supply ships by submarines and the difficulties of provision from Home could be made up. In fact, this output of serviceable equipment and spare parts proved the means of keeping many hundreds of vehicles on the road, which would otherwise have been standing idle in the repair workshops.

We may conclude, therefore, that although a Retrieving M.T. Workshop does not form part of an expeditionary force, one of the earliest units to be organized and despatched overseas after the departure of such a force should be a Retrieving and Salvage M.T. Workshop equipped with machine tools suitable for such work, and manned by a supervising staff selected from those who have had extensive experience in the actual repair and overhaul of motor vehicles on a large scale.

VII.—THE USE OF ROADS AND CROSS-COUNTRY TRACKS.

(1) EAST AFRICA.—Where engineered roads existed, they were excellent in character and suitable, if properly maintained, for all classes of M.T. vehicles all the year round.

During active operations, however, roads had to be cut out so quickly that little more was done than was necessary to provide a passage through the bush. Their efficiency thus depended entirely upon the nature of the soil. Where small timber had to be cleared it was found that owing to wear of the road or track after a very little use, tree stumps projected, causing heavy casualties with pneumatic tyred vehicles. It was in consequence found necessary for road corps to follow up the original pioneer parties to ease gradients, metal or corduroy bad places, bridge rivers, and cut out the small and large tree stumps, etc. In all some 450 miles of so-called motor roads or tracks through the bush were made in six months for light motor vehicles, and so enabled the number of head carriers to be very much reduced.

(2) SERBIA.—It was found necessary, except on well metalled roads permitting two lines of traffic, to prohibit the use of the same road or track for both light and heavy vehicles, if this could possibly be avoided. Similarly, it was still more important to prevent horse and motor traffic from using the same unmetalled roads and tracks.

Owing to the difference in speed between heavy and light motor vehicles, and between these and horse transport, much delay and congestion would inevitably occur on narrow roads, were such transport to be allowed to use the same roads, whilst on unmetalled roads, the surface soon becomes very bad after having been used by heavy motor vehicles and horse transport wagons and carts.

(3) MESOPOTAMIA.—It is much more economical to make and maintain roads or even tracks in good condition than to work expensive vehicles over rough surfaces of ground, and maintain a staff of skilled artificers to repair them.

Where labour is available and cheap, as in Mesopotamia, it is recommended that the thick dust caused by convoys and caravans should be removed from the surfaces of tracks and roads in the neighbourhood of standing camps.

(4) PALESTINE.—Rolls of wire netting, a yard wide and of one inch mesh, were used to make roads over sandy wastes. Three rolls of this netting were unrolled on the sand and laced together, so as to form a surface nine feet wide, in many cases the sand receiving no previous preparation.

As the rolls came to an end, further rolls were merely wired on, pegged at the outer edges, and so the road progressed. The difference between the loose sand surface and that of the wire road was very marked and, even in its crudest form, the road was a distinct blessing.

(5) THE CAMEROONS.—In the Cameroons, roads at the commencement of the campaign were practically non-existent, but by the construction of motor tracks or paths through the almost impenetrable bush, light Ford cars and vans were able to be employed, replacing the carrier services in this tsetse fly country, except for those areas into which these motor roads had not penetrated.

Up to the present, the employment of ordinary four-wheeled self-propelled vehicles has been practically restricted to the mileage of suitably metalled roads, but with the introduction of six-wheeled vehicles, there is no longer any necessity to use metalled or macadam roads, providing that when particularly soft patches have to be negotiated, they can be rendered firmer by artificial means. Even in untouched

country, beyond the limits of habitation, and except in the heavy rains, a mere wide clearing of the bush will enable the modern cross-country vehicle to progress at a speed and with a carrying capacity far ahead of anything that local resources can produce.

The conditions are now very different from those obtaining even at the end of the war since, provided sufficient local labour, bush cutting implements and funds are available, these post-war, six-wheeled vehicles should have but little difficulty in overcoming obstacles which were quite impassable to the four-wheeled machine.

In a theatre of operations where the terrain is either scrub or bush, it is suggested that any Expeditionary Force should set out provided with one or more pioneer units, equipped with an adequate supply of bush cutting and other implements, prepared to supervise large gangs of locally engaged native labour, in order to clear the way for mechanized maintenance services, when the force advances from the existing metalled roads into the interior. By such means many thousands of native porters, carrying food and ammunition, etc., can be released or be dispensed with, since their feeding and care not only adds much to the difficulties of the administrative services, but undoubtedly tends to retard the fighting troops and prolong tactical operations.

VIII.—Snow Plough and Rail Tractors.

(1) Mesopotamia.—It may be strange to state that a motor snow plough was used in Mesopotamia.

With a view to keeping open the roads in Persia during the winter, a plough suitable for attachment to a lorry was finally devised. The arrangement of the design adopted introduced a most interesting departure from general practice, since it could be driven over any sort of country without suffering damage. The blades were so arranged that they articulated and automatically lifted themselves when they met any obstruction heavier than snow, as the plough would definitely sweep aside anything which came in its way up to a predetermined weight, and, when this was exceeded, it mechanically rose and cleared the obstruction, afterwards immediately returning to its working position. The vehicle used in conjunction with the plough was a Fiat 30-cwt. lorry.

The device was tested on different weights of loose material, e.g., sawdust, sand and loose stones, and was then sent to Persia, where it carried out the work for which it was designed.

(2) East Africa.—To overcome difficulties met with by ordinary road transport or to relieve congestion due to its unsuitability for the country in wet weather on any but properly engineered roads, light rail traction was employed. Where the line was required more or less as a

temporary measure, the track was laid through the bush with the expenditure of a minimum amount of labour. These rough rail tracks, used by converted Fords drawing trailers, were a valuable asset to the transport service, their principal value lying in reduced vehicle casualties, immunity from stoppage in wet weather and increased carrying capacity.

A track, three and a half miles long, was able to convey a maximum of eight hundred men daily to and from work at all seasons of the year. A staff of two Europeans and ten natives was found sufficient to maintain the track in good condition.

IX.—Cross Country Motor Bicycles.

The possibilities of the employment of cross-country motor bicycles in a small war are not negligible. A three-wheeled single-track motor cycle has recently been designed, and preliminary tests show that the vehicle will travel over loose, soft and boggy ground, a fact hitherto denied to the ordinary motor cycle, while it is easier to ride and control on rough ground and handles well on the road. Narrow tracks and bush paths used by native carriers could well be used by such a machine, not only for inter-communication purposes in the carrying of messages and despatches but also in the maintenance of forward, isolated or detached troops. A load, in addition to the driver, of only two hundred and fifty pounds carried in panniers on *one* such machine, represents the weight of approximately three thousand rounds of S.A.A. or the rations for forty to fifty men, and in a daily journey of a radius of fifty miles from nearest ammunition or supply unit to such detached troops and back again, this would mean the replacement of some twenty to twenty-four head carriers, reckoning the load of a native at sixty pounds and his daily walking mileage through the bush at about twenty miles.

Here we have a machine which has great potential possibilities, both for private and commercial use in all our Crown Colonies and for employment in small wars. It is hoped that every endeavour will be made to encourage the commercial production of the perfected machine, which should prove so useful and valuable an accessory to any force operating in a tropical bush country.

In conclusion, we will append a quotation from another article in this Journal by Colonel Lindsell, in November, 1926:

> "It may be urged that the lessons in the organization and employment of mechanical transport in the late war and in the science of transport generally are among the most important in the whole war.
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> "The big questions of maintenance and movement are intimately bound up in every problem of war whatever its nature—strategy and tactics are now tied hard and fast by administration."

A RESERVE OF OFFICERS FOR THE TERRITORIAL ARMY

By Captain C. T. Beckett, M.C., R.A.

THERE are to-day only two basic qualifications for a commission in the Territorial Army. These methods are firstly, the acquisition of either Certificate "A" or Certificate "B" through an approved Officers' Training Corps; secondly, service in the ranks as a non-commissioned officer followed by the acquisition of the same certificate. In every case, therefore, the possession of previous military training attested by or supplemented by one or other of these certificates is the first essential for the consideration of the candidate's application. Suitability in all other respects is a factor which must vary with circumstances. The standing of the unit, the volume of supply, the number of vacancies, local demand, local urgency or local "politics" all have their place in the interplay of forces which influence the grant of the commission.

We are considering, however, a national emergency, and there can be little doubt that every individual who is in possession of one or other of the two certificates to which reference has been made would, in the absence of definite reasons to the contrary, such as age or known bad character, have a prior claim to a commission if he sought one, though no doubt he would have to undergo preliminary training before being considered fit to lead troops in the field. Whether such preliminary training would take place before or after commissioning is a question of detail which lies outside the present discussion.

If the flow of suitably certificated individuals is held to be insufficient, there are many ways in which it can be augmented. Public opinion makes membership of the Officers' Training Corps after a certain age, to all intents, obligatory at most schools. It is only another step for such public opinion, fortified of course by the support of the headmaster, to demand that every individual shall endeavour to qualify for Certificate "A" during his last year's residence. Pride of school or university will certainly demand that the majority of its fully educated young men shall be found in the commissioned ranks with sufficient elementary knowledge to assist in turning the country into a nation in arms.

The particular difficulty with which the Army is faced in endeavouring to make use of those persons already so qualified and registered is the

impossibility of following them up so that their services may be made available, without the imposition of vexatious regulations and restrictions, the evasion of which would be easy and the exaction of which would be impossible in such an Empire as ours.

All the Public Schools or Universities, or at any rate all from whom one might expect to obtain an appreciable number of officers, maintain Old Boys' Associations in some form or other, and one of the functions of such associations is the registration of the address of every member and the supply to him annually of literature which usually includes a register of such addresses. It would in no way increase the labours of those who make the preparation of these lists their hobby and a labour of love if the possessors of such certificates who had been accepted under the scheme which will be outlined later, were starred in the annual publications, and if a copy of the publication were forwarded annually to the War Office for scrutiny and amendment of the records when occasion arose. Such a procedure would enable the War Office to keep touch with qualified candidates for commissions, an essential which is now impossible.

It will be as well, however, to examine the further possibilities of such a scheme so that these individuals may be provisionally allocated to units before they disappear overseas or away from their homes to other parts of the kingdom.

We may assume for purposes of argument that every unit of the Territorial Army will be required to duplicate itself on embodiment for a war of national importance. The senior officers for these units thus thrown off will not be hard to find. The Territorial Army Reserve, the medically unfit for the first line, or those considered fit for special promotion will form a corpus round which the unit will build. It is primarily the provision of the junior ranks that will be difficult.

Now most persons when they sit for Certificate "A" do so with the definite intention of ensuring that in the event of a national emergency they will be called upon to serve as officers and not in any other capacity. Then is the moment to call upon them to register their names for the Territorial Army Reserve, Class III, let it be called, for service with the Territorial Army of a definite county with a preference for a definite corps.

The conditions of service would be, both from motives of strict economy and to ensure general acceptance, of necessity very light. Attachment for Annual Training to the unit concerned might well be permissible under similar conditions to those existing for Classes I and II of the Territorial Army Reserve. Four attendances might be permitted to qualify for an outfit grant which would be somewhat superior

to that inevitably granted when the officer was called up for embodiment. Attendance at evening classes, week-end camps or courses might be permitted to count towards seniority in the Reserve on embodiment and pay might be sanctioned where the Training Grant could afford it and where no active Territorial officer was available for the training in question. Few would be able to take advantage of such facilities but their existence would be beneficial to the morale of the Reserve. There should be no obligations beyond notification of change of address to the Old Boys' Society concerned, and this obligation might well be left to the society to formulate. In particular, insistence on application for leave to travel abroad should be entirely waived.

The candidate, whose "home" or "employment" county should have been previously ascertained, would be offered for signature two forms, one, the form which he would ordinarily complete with a Banker's Order for the Life Membership subscription of his Old Boys' Club or Society; the other, a form which he would address to the Secretary of the Association of the County of his home, or of his probable future employment, announcing his readiness to join the Reserve if successful at the examination and stating, by means of numerals, against a list furnished on the form, the order of preference of choice of the units which that Association administers. This form, with a certificate of character from the headmaster, would be forwarded to the Secretary of the Association concerned. The Secretary of the Association would cause local enquiries to be made concerning the candidate, and, on his success being notified, would ask him to call for an interview.

It is apparent that the candidate's choice alone cannot be the governing factor of his posting. Conditions vary considerably between Territorial Army Units and it is certain that some corps will find no difficulty in completing their reserve from the type of candidate which they wish to encourage, whilst others will not be so fortunate. The candidate, therefore, who can attach to his application a letter from the Commanding Officer of the unit of his choice, will naturally assist the Secretary of the Association. For the rest his knowledge of the characteristics of the units of his county must be the guide of the Secretary concerned. No board of Commanding Officers will be possible. The allocation will occasionally be of too invidious a nature.

The candidate, the War Office, the Old Boys' Association and the unit concerned, would be notified of the Secretary's posting and the clerical labour connected with that individual's military career will be closed until the embodiment of the Territorial Army causes his recall. Whether these persons are commissioned forthwith, or on embodiment, is an incidental. Their "trace" will have been established and their services definitely secured if required.

We now come to the final difficulty.

At the moment of embodiment the position of all such " Reservists " in the United Kingdom is a simple one. Many will be so situated that their services to the nation will be more valuable where they are employed than as Second Lieutenants in the Territorial Army. Such gentlemen may reasonably state their case if they or their civil superiors so desire. They will have plenty of time in which to do so and their summons to the colours will but cause temporary inconvenience. The division of the reserve into three " age " classes and two " overseas " classes would grade the likelihood of recall and offer adequate scope for adjustment. These classes might be :

TERRITORIAL ARMY RESERVE, CLASS III.

Subhead	A.	18-25.	Persons situated in U.K. and Northern Ireland.
„	B.	25-35.	„ „ „ „ „
„	C.	35-45.	„ „ „ „ „
„	Y.	18-35.	Persons situated in India, African and Tropical Dominions, Dependencies and Colonies.
„	Z.	18-35.	Persons situated in all other Dominions, Dependencies and Colonies.

So far as " Reservists " overseas are concerned, they should not be recalled for embodiment individually, from India or from the Tropical and African Dominions and dependencies. The situation of individual Europeans in such countries is a matter of intimate concern to the local Governments, both from the point of view of local defence and from the aspect of the satisfactory continuance of local civil administration. It is suggested, therefore, that bulk telegrams embodying all the reserve officers employed or temporarily domiciled in such countries should be sent to the Governor concerned, leaving it to him to release for service in the United Kingdom such as he may feel that his administration can conveniently spare.

The officers would be notified as to their posting orders by telegram through the Governor, as soon as their release by him had been notified to the Home Government. Members of any class of the Reserve joining local overseas forces of the Crown would cease to be under any of its obligations and would be struck off.

It is relevant to consider briefly how the establishment of such a reserve might affect the recruitment of officers for the standing Territorial Army. The establishment of such a method of satisfying easily the pangs of patriotism might be suspected of rendering less audible the higher call to a more active participation in military affairs ; whereby

the already sufficient difficulty of officering the Territorial Army will be enhanced. Now it is possibly true, to a very limited degree, that the flow of candidates for the Regular Army has been stemmed by the knowledge that, when war comes, the Territorial Army will provide an easy avenue of participation without the discomforts of early military life. The erstwhile regular candidate can, meanwhile as a Territorial Officer, turn his activities into more lucrative channels. It is possible that such a factor might arise and influence the minds of a few suitable candidates for active Territorial commissions.

On the other hand the information at the disposal of Secretaries of County Associations as to the location of suitable candidates at their most impressionable age would be exhaustive, and the work of recruitment and canvassing of likely candidates would be thorough and not confined to the social acquaintance of the Commanding Officer or company officers of the units of the County. It is more probable that the candidates lost by the easier terms of service would be more than counterbalanced by those attracted by the more efficient recruiting organization which would be built upon the registration system suggested.

This, in brief, is a skeleton scheme for the recruitment, allocation and posting of all individuals who take the two elementary certificates of military education, and suggests a means whereby additional clerical outlay can be avoided and the existing Territorial Association machinery and the conditions of scholastic and civil life may be utilized with special provision for the peculiarities of overseas employment, to which so many of the persons affected turn.

It presupposes two necessities. Firstly, that every candidate is willing to join his Old Boys' Society, or whatever similar society may exist. It may be said that to-day the majority of the boys leaving school do so, and this is certainly true of the totality of boys of the right type with any affection for their school; those who do not will not be much missed. Moreover, all those who have dealt with youth are well aware that, provided the form which they are called upon to sign is sufficiently attractive and carries with it no onerous conditions of annual payments likely to be forgotten, signature is not hard to obtain. At that age it is the father who pays the boy's life subscription. Secondly, it presupposes the readiness of the Old Boys' Societies to record the necessary information in their lists of members and their ability to keep abreast of the changes of address. The experience of most of us is confined to but one Old Boys' Society, but it is probably true that the loss of trace of a member is considerably lower than one per cent. These have rarely been persons who would have been starred as possessors of Certificate "A."

This entire question is of the utmost importance to the nation. Its solution is essential if the Territorial Army is to be the national framework of organization in the next Great War.

APPENDIX.

STATISTICAL INFORMATION CONCERNING A SELECTED AND TYPICAL OLD BOYS' SOCIETY.

Life Subscription, £3, or 5/- a year.		
Total Number of Members, 1927		2,481
Total Life Membership, 1927		1,928
Percentage Life Members of total	78%	—
Average Number of Boys leaving School annually, 1922-25 (*a*)	—	120(*b*).
Average Annual entry to Society, 1922-25	—	131(*b*).
Numbers who have obtained Certificate "A", 1922-25	—	195
Numbers holding Certificate "A" who have joined Society, 1922-25	—	159(*c*)
Numbers holding Certificate "A" who have joined Society, percentage 1922-25	80%	—
Loss of Trace amongst above 159	—	1
Number of Boys leaving School year ending 31st July, 1927	—	118
In possession of Certificate "A", 1927	—	95
Percentage joining as Life Members, 1927	55%	
Percentage joining as Annual Members, 1927	33%	
Did not join	12%	
Annual Return through the Post of Annual Reports indicating unnotified change of address, Maximum	—	40
Minimum	—	13
Percentage of Total Membership, say	1.5%	
Total Loss of Trace	—	12
Or about	.5%	
of this total number, Overseas Members account for	—	1
Percentage Membership Overseas and Dominions	9%	
Percentage Membership Asia and Tropical British Possessions	10.5%	

(*a*) 1926 was an exceptional year for entry into the Society for special reasons and has been excluded.

(*b*) The higher figures of entry into the Society over those leaving the School is due to efforts in connection with the reissue of the School Register.

(*c*) Does not include those who may have obtained Certificates in previous years and joined in 1922. Manifestly not all who obtain Certificate "A" leave the same year. For this reason figures have not been included for 1926 and 1927.

A SIMPLE DISCIPLINARY CODE

(The Articles of War of the United States)

By CAPTAIN H. BULLOCK, Indian Army.

(A) INTRODUCTORY.

In view of the admitted necessity for revision and condensation of our code of military law,[1] followed as a natural consequence by a revision of our "Manual of Military Law," it should prove interesting to examine the Articles of War by which the United States Army is governed, for these Articles were thoroughly overhauled as recently as 1916, being re-enacted with minor amendments in 1920.

The first American Articles of War (1775) were based on the British Articles of 1774; our Army Act and the Articles of War of the United States are therefore of common stock. It is, therefore, more profitable to compare our code with this than, say, with the *Code de Justice Militaire*,[2] since the directions in which the two codes have since diverged and the probable reasons for such divergence afford valuable material for study; moreover, both codes are in English. Nor must the similarity of the Federal criminal law to ours be forgotten, whilst on the other hand the French law and procedure, especially of courts-martial, are basically different.

The United States Articles of War comprise 121 Articles, and are to be found in the official publication, "Military Laws of the United States."[3] This work is an example of utter thoroughness, being a compendium not only of the laws for the maintenance of discipline, but also of all statutes and regulations having the least bearing on any part of a soldier's responsibility, the whole being copiously annotated. Its composition appears to a layman beyond criticism: its index is a marvel of comprehensiveness.[4]

It is only proposed to review the provisions of the United States Articles of War, omitting matters of procedure dealt with elsewhere. The similarity of their code to ours will everywhere be apparent. Like

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[1] See, for instance, the Report of the Darling Committee on Courts-Martial, 1919, para. 6.

[2] See JOURNAL OF THE R.U.S.I., April, 1927.

[3] Washington, 6th Edition, 1921. 2 Vols.

[4] Unlike almost all English legal works, including the "Manual of Military Law."

the Army Act it is divided into five parts, which however differ from those into which our Act is divided; they are:—

(i) Preliminary Provisions, Articles 1–2;
(ii) Courts-Martial, Articles 3–53;
(iii) Punitive Articles, Articles 54–96;
(iv) Courts of Inquiry, Articles 97–103;
(v) Miscellaneous Provisions, Articles 104–121.

The preliminary provisions define the terms—"officer," "soldier," "company" and "battalion"; and, further, state clearly what persons are subject to military law.

(B) COURTS-MARTIAL: APPOINTMENT, COMPOSITION AND POWERS.

Part II (Courts-Martial) begins by enumerating the three kinds of courts-martial, viz., general, special, and summary; stating who may serve on such courts; and laying down that a *general* court-martial shall be composed of not less than five officers, a *special* of not less than three, and a *summary* of one only. The use of the term *special* to designate a military court of secondary importance may be held preferable to our practice of calling such courts *district* courts-martial, since they have no reference to any "district" organization, military or civil.

Next the appointment (or as we call it, the *convening*) of courts-martial is provided for, the arrangements being generally similar to ours; and it is also enacted that "the authority appointing a general court-martial shall detail as one of the members thereof a law member, who shall," when available, "be an officer of the Judge Advocate-General's Department" or some specially qualified officer selected for the duty. This law member rules on points of law arising during the proceedings.

The appointment of summary courts-martial have as yet no counterpart in the British Service although they have long formed part of the Indian Army.[1] In the United States Army, a summary court-martial can be convened by "the commanding officer of a garrison, fort, camp, or other place where troops are on duty, and the commanding officer of a regiment" (*our brigade*) "detached battalion, detached company, or other detachment," or by superior authority. Such courts usually consist of the second-in-command; but if only one officer is present in a command he may appoint himself and sit as the summary court. In the Indian Army Act the provision as to who may convene a summary court-martial is similar, but the commanding officer sits as the court.

[1] See in this connection "The Summary Court Martial," *Army Quarterly*, April, 1926.

For each general and special court-martial the convening authority must appoint a *trial* judge advocate[1] and a defence counsel. These officials have assistants at a general court-martial, and are debarred from acting as *staff* judge advocates and reviewing the case later, as are their assistants also.

General courts-martial (with one minor exception) may try any person subject to military law for any offence against the Articles of War, whilst special courts-martial (subject to any limitation set on them by the President of the United States) may try any such offence other than one for which capital punishment may be inflicted. Summary courts-martial may not try officers, warrant officers, cadets and the like ; nor may they try a non-commissioned officer, if he objects thereto, without the specific authority of an officer competent to order his trial by general court-martial. The powers of a summary court-martial are limited to the award of one month's confinement, three months' " restriction to limits," or forfeiture or detention of two-thirds of one month's pay.

A provost, though in the British Army he no longer has the power of inflicting any punishment, however small, on his own authority, still retains a jurisdiction in the United States army, " limited exclusively to minor offences, tending to disorder and breaches of the peace, by soldiers and citizens within the lines of an army."

The only other noteworthy provision is that an officer is triable only by general and special courts-martial, and in no case when it can be avoided shall he be tried by officers inferior to him in rank. In British procedure a district court-martial can only commit an officer for contempt.

(c) PROCEDURE OF COURTS-MARTIAL.

At a general or special court-martial, the trial judge-advocate shall prosecute and keep the record of the proceedings ; though it is difficult to understand how he can maintain that standard of impartiality desirable in a legal recorder, and simultaneously pursue the prosecution. Challenges " for cause stated " may be made by the accused or by the trial judge advocate, and each side is also entitled to one peremptory challenge. The law member of the court may not however be challenged without special cause.

The president and members are then sworn by the trial judge advocate, the form of oath much resembling the British : then the president administers the oath to the trial judge advocate and his assistants, if any.

[1] So called to distinguish him from the *law member* already referred to, and from the *Staff* judge-advocate who scrutinizes the proceedings after trial, and advises the reviewing authority.

Witnesses, the reporter, and the interpreter also take oaths much resembling ours.

Adjournments (the American expression is " continuances ") may be granted on the application of either the prosecution or defence " for reasonable cause," " for such time and as often as may appear to be just."

The next clause lays down that when an accused on arraignment fails or refuses to plead, or answers foreign to the purpose, *or after a plea of guilty makes a statement inconsistent with that plea*, or when it appears to the court that the accused pleaded guilty improvidently or through lack of understanding of its meaning and effect, the court shall proceed to trial and judgment as if he had pleaded not guilty. The words italicized above should be noted. It has frequently happened at courts-martial under our Army Act that an accused, after pleading guilty, has made a statement in mitigation of punishment, the terms of which have negatived his plea of guilty. The court, not realizing the import of this, have proceeded to consideration of their sentence; and on review the proceedings have almost invariably been set aside, thus frequently bringing about a miscarriage of justice. In view of the practical importance of the matter and in the interests of discipline, the point may be thought to deserve more notice and a place in the body of the Rules of Procedure or of the Army Act.

After due provision for procuring the attendance of witnesses by summons issuable by the trial judge advocate, the scale of punishments for their wilful non-attendance is set forth.

In our military code no general provision exists for the taking of evidence on commission: a state of affairs which, however justifiable on legal grounds, sometimes results in expense and inconvenience. In the United States, depositions recorded in a proper manner, after reasonable notice to the opposite party, are admissible in non-capital cases, so long as the witness in question " resides, is found, or is about to go beyond the State, Territory, or District in which the court, commission, or board is ordered to sit, or beyond the distance of 100 miles from the place of trial or hearing, or when it appears to the satisfaction of the court, or appointing authority that the witness, by reason of a truly reasonable cause, is unable to appear in person at the place of trial or hearing "; with the proviso that depositions may be put in by the defence in capital cases. It is suggested that the question whether written statements *not* made in the presence of the accused might be made admissible in evidence at our military trials, deserves consideration. Economy, unaccompanied by detriment to the accused, must be the objective though admittedly difficult of attainment.

The code details certain acts which shall be deemed to constitute desertion. Any officer, for example, who having tendered his resignation, but prior to due notice of its acceptance, quits his post or proper duties without leave and with intent to absent himself permanently therefrom, is deemed a deserter. There is a similar clause for other ranks, and it is also provided that " any person subject to military law who quits his organization or place of duty with the intent to avoid hazardous duty or to shirk important service, shall be deemed a deserter "—a notably clear and explicit rule, which substantially accords with the British law and practice.

An acquittal *on all charges* is announced in open court; and in case of conviction the findings and sentence may be announced under such regulations as the President of the United States may prescribe.

When the court is closed, the trial judge advocate (and his assistant, if any) must withdraw. Voting upon challenges, and on the findings and sentence is by secret written ballot, the votes being counted by the junior member and checked by the president who announces the result to the members. The British code now lays down that the voting must not be by written ballot.

The law member (or in the absence of one, the president) rules on points of law arising during the proceedings, such rulings being given in open court. Contempt of any military tribunal by any person using " any menacing words, signs, or gestures," or disturbing the proceedings, may by that tribunal be mulcted in one month's confinement or a fine of 100 dollars, or both.

(D) VARIOUS PROVISIONS AS TO COURTS-MARTIAL.

After provisions dealing with the maintenance and disposal of records of proceedings, and a clause to the effect that a conviction shall not necessarily be invalidated by irregularities except those which have " injuriously affected the substantial rights of an accused," the President is given power to prescribe rules of procedure for all military courts, which must not be inconsistent with the Articles of War themselves, and which are to be laid before Congress annually.

Except for desertion in time of war, mutiny and murder, no person may be tried or punished by a court-martial for any offence committed more than two years before his arraignment, subject to the proviso that for desertion in time of peace and for most serious felonies and misdemeanours, as also for defrauding the Government, the period of limitation shall be three years. The British law is very similar. Towards these periods is not reckoned any time the accused may have spent outside the jurisdiction of the United States, or any period during which " by reason of some manifest impediment the accused shall not

have been amenable to military justice "—a very sensible provision, perhaps worthy of our notice.

A finding of Not Guilty on any or all of the charges may not be returned by a superior authority for a court to reconsider; nor may this be done with a view to increasing a sentence, unless the sentence first awarded was less than the minimum sentence fixed by law.

(E) PUNISHMENTS AND EXECUTION OF SENTENCES.

"Cruel and unusual punishments of every kind, including flogging, branding, marking, or tattooing on the body, are prohibited." Provision is next made for the execution of sentences of confinement, followed by a clause enacting that a sentence of death may only be awarded by an unanimous vote of the members of the court, whilst a sentence of imprisonment for life, or for more than ten years, needs the concurrence of three-fourths of the number. All other convictions and sentences of a court-martial may be arrived at by a two-thirds majority, and other questions by a simple majority.

An interesting Article prescribes that when an officer is dismissed from the service for cowardice or fraud, the crime, punishment, name and place of abode of the offender must be published in the newspapers in and about the camp and in the State from which the offender comes: after such publication any officer associating with him is deemed guilty of scandalous conduct. This provision though undeniably drastic appears to be unassailable either on the grounds of moral principle or the preservation of military discipline.

(F) ACTION BY SUPERIOR AUTHORITY.

Any superior authority before dealing with the proceedings of a trial by general court-martial or military commission must refer them to his staff judge advocate or to the Judge Advocate-General; and no court-martial sentence may be put into execution until approved by the convening authority.

Confirmation by the President of the United States is necessary in the case of any sentence on a general officer, any sentence of death (except *in time of war* for the offences of murder, rape, mutiny, desertion, and espionage), and any sentence of dismissal on an officer. In time of war, however, a sentence of dismissal on an officer below the rank of brigadier-general may usually be carried into execution on the authority of the commander-in-chief of the forces in the field. Provision is made for the mitigation and remission of sentences.

(G) REVIEW AND REHEARING.

A "board of review" consisting of not less than three officers of the Judge Advocate-General's department is constituted at the office of the

Judge Advocate-General to examine the proceedings of all courts which require the approval or confirmation of the President.

Again, ordinarily no authority may order the execution of any sentence of death, dismissal, dishonourable discharge, or confinement in a penitentiary unless and until the board of review, with the Judge Advocate-General's approval, have held that the evidence in the record is legally sufficient to support the sentence. (An exception to this rule is made in some cases where an accused has pleaded guilty.)

When the President or other authority disapproves or sets aside a sentence, which in consequence is not put into execution, he may authorize or direct a rehearing, at which the accused may not be tried for any offence of which he was not found guilty by the first court, nor may he ordinarily be awarded a sentence more severe than the original one.

In addition, an automatic retrial ("rehearing") follows in all cases where a finding and sentence are set aside by the advice of the board of review on the grounds that the evidence adduced is legally insufficient to support the conviction, or that errors of law have been committed, unless the findings or sentence are approved in part only, or the case is returned to the original court for revision, or it is altogether annulled.

Apart from the above, the proceedings of every other trial by general court-martial are also examined by the board of review. Any faulty cases thus found are submitted to the Secretary of War for the President's orders, who may take appropriate action to approve, annul, mitigate, commute or remit.

(H) OFFENCES.

Offences connected with enlistment, musters, and returns are first dealt with. The punishment of fraudulent enlistment and unlawful enlistment is provided for: it is to be noted however that the term "fraudulent enlistment" is in the United States employed to designate the offence committed by one who procures himself to be enlisted "by means of wilful misrepresentation or concealment as to his qualifications for enlistment," and receives pay or allowances in consequence of such enlistment. *Unlawful* enlistment is committed by the enlistment, knowingly, of any person whose enlistment is prohibited by law, regulation, or order. Amongst these are persons under the age of sixteen, insane and intoxicated persons, deserters from the U.S. Army, and those who have been convicted of any criminal offence.

An officer who renders false muster rolls, or the like, may be punished with dismissal.

(I) DESERTION,

Desertion or attempted desertion is in time of war punishable with death, and in peace with any punishment excepting death that a court-martial may inflict. The capital punishment may also be inflicted in time of war for advising, persuading, or knowingly assisting another to desert the service of the United States: in peace, any punishment but death may be awarded by a court-martial for this offence.

(J) DISRESPECT, INSUBORDINATION AND MUTINY.

(K) ARREST AND CONFINEMENT.

The offences under these heads much resemble those under the Army Act, and a detailed relation of them is therefore unnecessary.

(L) INVESTIGATION OF CHARGES.

"Charges . . . must be signed by a person subject to military law, and under oath either that he has personal knowledge of, or has investigated, the matters set forth therein, and that the same are true in fact, to the best of his knowledge and belief. No charge will be referred for trial until after a thorough and impartial investigation thereof shall have been made. This investigation will include inquiries as to the truth of the matter set forth in said charges, form of charges, and what disposition of the case should be made; opportunity shall be given to the accused to cross-examine witnesses against him if they are available and to present anything he may desire in his own behalf, and the investigating officer shall examine available witnesses requested by the accused. If the charges are forwarded after such investigation, they shall be accompanied by a statement of the substance of the testimony taken on both sides.

"When any person subject to military law is placed in arrest or confinement, immediate steps will be taken to try the person accused or to dismiss the charge and release him. Any officer who is responsible for unnecessary delay in investigating or carrying the case to a final conclusion shall be punished as a court-martial may direct. Otherwise, if the same be not practicable, he will report to superior authority the reasons for delay.

"The trial judge advocate will cause to be served upon the accused a copy of the charges upon which trial is to be had, and a failure so to serve such charges will be ground for a continuance (= *adjournment*) unless the trial be had on the charges furnished the accused as hereinbefore provided. In time of peace no person shall, against his objection, be brought to trial before a general court-martial within a period of fiv days subsequent to the service of charges upon him." (Article 70.)

(M) WAR OFFENCES include :—

(i) Misbehaviour before the enemy, i.e. :—

(*a*) Misbehaviour, running away, shamefully abandoning or delivering (or by any misconduct, disobedience or neglect endangering the safety of) any post, camp, guard, etc., which it was the accused's duty to defend ;

(*b*) speaking words inducing others to do the above ;

(*c*) casting away arms or ammunition ;

(*d*) quitting one's post or colours to pillage ; and

(*e*) by any means whatsoever occasioning a false alarm in camp, garrison, or quarters.

(ii) Compelling, or attempting to compel, any commander to give up to the enemy, or abandon, his garrison or other command.

(iii) Making known to an unauthorized person the parole or countersign, or giving one different from that received.

(iv) Forcing a safeguard.

[The above are punishable with death in war.]

(v) Neglecting to secure for the benefit of the state any public property taken from the enemy, or wilfully misappropriating the same.

(vi) Improperly dealing in captured or abandoned property.

(vii) Relieving the enemy with arms, ammunition, supplies, money, or any other thing.

(viii) Knowingly harbouring, protecting, or holding correspondence with the enemy, directly or indirectly.

[Offences falling under the last two clauses are also punishable capitally in time of war.]

(N) ESPIONAGE.

Any person (not only such as are subject to military law) who in time of war is " found lurking or acting as a spy in or about any of the fortifications, posts, quarters, or encampments of any of the armies of the United States, or elsewhere " is to be tried by a general court-martial or a military commission, either of which must (the law is imperative) sentence him to death if he be convicted—there is no alternative punishment provided. During the Great War it was held that even the port of New York could not be considered outside the field of active operations and the theatre of war, and a German spy arrested there was tried by a (naval) court-martial.

THE SUBMERGED DIMENSION.

By LIEUTENANT-COMMANDER J. L. F. HUNT, R.N.

"Talk about those subjects you have had long in your mind and listen to what others say about subjects you have studied but recently. Knowledge and timber shouldn't be much used till they are seasoned."

OLIVER WENDELL HOLMES,
"The Autocrat of the Breakfast Table."

WHENEVER any incident or accident occurs to draw public attention to submarines there is never any lack of articles advocating their abolition. These articles possibly overlook the fact that submarines are exercising daily in many parts of the world, and that there is something to be said for their retention.

The principal object of all sea warfare is to preserve the freedom of the lines of sea communication for one's own country while denying it to the enemy; and this is all that a victory at sea can decide in its own sphere. Indirectly victory at sea may produce other results, such as conquest, aggression or the capitulation of the enemy's armed forces on land; but a "fleet in being" is not directly concerned with these.

The justification for constructing and maintaining a powerful submarine arm depends solely, then, on whether it can prove its value in achieving this legitimate object of sea warfare. If it can, it is worth having; and its other advantages, if any, may then, and only then, be discussed.

Submarines, although having a history of research and experiment dating back to 1578, are, in their present form and state of development, a comparatively recent creation. They might even come under Mr. Holmes' remark as being unseasoned, in view of the fact that the late war is the only real seasoning they have had; and on that alone can a knowledge of their value be based. But that seasoning was a searching and a good test. Admiral Sims, writing to the United States, in 1917, gave the following views on them, employed as they were by Germany: "The Germans . . . were not losing the war; they were winning it. . . . The British Admiralty now placed before the American Representative facts and figures which it had not given to the British Press. These documents disclosed the astounding fact that, unless the appalling destruction of merchant tonnage which was then taking place could be

materially checked, the unconditional surrender of the British Empire would inevitably take place within a few months . . . The next few months, indeed, both in the estimation of the Germans and the British, would witness the great crisis of the war; the basis of the ruthless campaign upon which the submarines had entered was that they would reach the decision before winter closed in. . . . So far as I could learn there was a general belief in British naval circles that this plan would succeed. The losses were then approaching a million tons a month; it was therefore a matter of very simple arithmetic to determine the length of time the Allies could stand such a strain. According to the authorities, the limit of endurance would be reached about 1st November, 1917; in other words, unless some method of successfully fighting submarines could be discovered almost immediately Great Britain would have to lay down her arms before a victorious Germany."

That the 'victorious' submarine campaign was, in many ways, on a par with the violation of Belgian neutrality by the same nation cannot be denied, but that it nearly succeeded in crippling the Allies is also equally true. If, therefore, this summary of the situation in 1917 was correct, as in substance it was, two distinct facts emerge from its consideration :—

(*a*) Some method of successfully combating losses by submarine attack was eventually evolved;

(*b*) Every possible step must have been taken since to prevent such a situation arising again.

It is, therefore, from aspects outside German methods, even if their repetition can be anticipated, that conclusions must be drawn.

It is a significant fact that naval Powers throughout the world have continued to build and perfect their submarine arms, and this in spite of bitter controversy, some serious accidents, many rather vague humanitarian arguments, and an almost general desire to economise and to "outlaw" war.[1]

It stands to reason, then, that there are important strategical reasons for maintaining submarines as well as for forging weapons for their destruction. In fact, submarines persist because they fulfil a definite function in naval strategy which no other class of vessel can achieve in

[1] As far as can be ascertained by the ordinary student of such things, Great Britain has been the only Power that has seriously considered the abolition of submarines and has made an offer on the subject. But this may be, perhaps, more a part of her general policy in regard to disarmament than the conclusions of her Naval Staff. (The United States has, more recently, made tentative suggestions of a similar nature, but the abolition of submarines is invariably rejected by the lesser naval Powers.—EDITOR).

quite the same way. This function may be briefly comprehended in the word "surprise." Even on the high seas the enemy is uncertain how much of his movements may be observed and reported; he is liable to an attack which he cannot see or forestall and one also which is open to repetition. It was this element of surprise in the German submarine campaign which so nearly brought off its successful realisation before the Allies could recover, and it is for this reason that the submarine must continue, although employed in a different way.

A submarine's threat to the enemy, and incidentally its own safety, lies in its invisibility and as long as this can be maintained it will be of value to the fleet, quite apart from its value as a commerce raider. This quality of invisibility is now considerably threatened:—

(1) From the air, particularly in clear weather even if at periscope depth;
(2) By the close and distant screens of convoys and fleets which put the submarine at a disadvantage when attacking its main object: enemy heavy ships;
(3) Detection by under-water sound signalling or similar devices fitted in specially designed anti-submarine craft.

It may be argued that a point has been reached at which it is necessary to determine whether submarines will be able to maintain their powers of surprise and invisibility under normal war conditions; or whether their mobility may not be too much restricted by modern anti-submarine methods. Without going into the details it can be stated that recent trials and experiments show that a submarine on patrol must exercise extreme caution if aircraft are known or even suspected to be in the vicinity; and, with regard to the penetration of a screen, a submarine may be said to have, at the least, an even chance of delivering an attack on the heavy ships without detection. In fact it may be said that the submarine has maintained its mobility, but with diminished chances of success due to the institution of a recognised anti-submarine arm.

But there is a further consideration which has influenced the situation in recent years. The adoption of the modern principle of "equality in naval armaments" and other proposed limitations may tend to bring about a situation of naval stalemate, which, in time of war, might result in neither of the opposing Commanders-in-Chief being desirous of accepting action unless some successful strategy or fortuitous accident gave them a temporary advantage. The aim of the opposing Commanders-in-Chief would, therefore, be to produce a disparity in the fleets before a fleet action was hazarded. This might be achieved at a comparatively small sacrifice by a successful submarine attack and in this connection

would appear to lie the submarine's most vital value to the fleet in the future.

Its remaining functions may be briefly summarised :—

(1) On distant patrols, for reporting any movements of the enemy ; (aircraft, carried in submarines, may assist in the reconnaissance, even off the enemy coast) ;

(2) Patrolling focal points to intercept attack and report the presence of enemy convoys ; (aircraft, carried in submarines, may assist in directing the latter to select the course and speed necessary to intercept and attack) ;

(3) To sink partially damaged enemy ships after an action ;

(4) Coastal Defence.

Submarines are now designed capable of fulfilling all these functions. They have endurance, seaworthiness, armament and means of communication equal to surface ships of much greater displacement. In heavy weather a submarine of the ocean going type can, probably, make better speed than surface craft of corresponding size, while their habitability in all climates has been tested and proved.

Advances in design and construction, however, have not been altogether in favour of the submarine and the progress of the anti-submarine weapons would tend to diminish the submarine's chances of success still further but for the fact that the means employed are double edged and may possibly be as of much use to the submarine as to the surface ship. It must not be overlooked, though, that the mere recognition of the powers inherent in submarines has made it impossible, in future, for belligerents to take the sea without every safeguard against submarine attack being employed. Whether these safeguards will prove insuperable obstacles remains to be seen, but new developments on the technical side of submarine attacks at least tend to reduce the limitations imposed by having to rely on " one man and one periscope." For example, submerged wireless installations can now be used to obtain bearings and ranges of surface craft. Again, long-range torpedoes, running at high speed and fired from more than one submarine, can be fired in a salvo of at least twelve to cross the enemy's track almost simultaneously.

Several pages could very well be filled with technical developments, but most of them are not of a nature which could be discussed here. Final success in submarine warfare, as in every other, depends primarily on the personnel. From this point of view submarines have a great attraction. War has been described as " the finest form of big game shooting ever invented " and this certainly applies to submarine attacks whether in war or only in peace exercises. It may be observed that

from the submarine's point of view practically the only difference between war and peace conditions is the substitution in peace of a " collision " head for the war head of the torpedo. To hit a battleship steaming at over 20 knots with a torpedo only running at 30, in a moderate seaway at a depth of 30 feet and the periscope washing down with spray is as difficult a shot as a high pheasant in a strong wind, especially if zig-zagging—and you may be caught on the " wrong leg " in both cases! Anyhow legitimate submarine warfare is always a sporting contest and peace time practices are excellent training.

Without undue bias, therefore, it may be stated that submarines fulfil practical functions in peace and war; that the anti-submarine weapons have not yet rendered them abortive and that the adoption of an international principle of " equality in fleets " lends them an added value.

Rudyard Kipling, in his " Fringes of the Fleet," says of them: " Like the destroyer the submarine has created its own type of officer and man; with a language and traditions apart from the rest of the Service and yet unchangingly of the Service . . ." " The commander's is more a one man job and the crew's is more team work than any other employment afloat. That is why the relations between submarine officers and men are what they are . . ." In short, submarine service provides valuable training in responsibility and team work without too much regard for the overworked " Safety First " principle.

THE FRENCH LAW ON THE RECRUITING OF THE ARMY

(Specially contributed from a French military source)

THE French Parliament, on 31st March, 1928, accepted a new Bill on the Recruiting of the Army, which is the corollary of that of 13th July, 1927, regarding the General Organization of the Army.[1] The latter maintained compulsory service for the standing army which is to serve in peace-time as a training school, and in time of war as a covering force as well as the nucleus from which would be drawn the cadres of the national forces. The object of the Law is to reduce the term of compulsory service to a minimum so as to return as many men as possible to civilian life. Without resorting to a militia system the authorities went very far in that direction. Taking into account the reduced birth-rate of France, it would be impossible to shorten any further the time of service without breaking completely with the principle of a standing army.

The object of the Law was the following: to fix the shortest period of service and establish the best means of carrying into effect the organization laid down in the Law of 13th July, 1927.

The best solution found was that compulsory service should only last twelve months, that every yearly contingent should be called up by half and that certain measures should be taken in order to prevent the men from devoting their time to other duties than their pure military training. To achieve this end the Army would need strong cadres and it would consequently be necessary to recruit a sufficient number of long service men.

The Law states that the Army will in peace time comprise 20 Divisions which will constitute the permanent garrisons of the Home Country and of the Colonies, together with the mobile forces stationed in France and Northern Algeria in readiness to be sent over to any menaced point of the French Colonial Empire. To comply with these conditions the French General Staff reckoned that they would require 240,000 yearly recruits,

[1] A synopsis of this Law was published in the JOURNAL of the R.U.S.I. for November, 1927, page 839.

90,000 North African Natives, 85,000 Colonial Natives, and 106,000 French long service men; that is, a total of 521,000 men. In addition, they would require 40,000 gendarmes and mobile Republican Guards, 18,000 Foreign Legionaries, and 11,000 irregulars. The grand total would thus come to 590,000 men.

This figure may seem large, but is imposed upon France by the extent of her Colonial Empire, the second in the world, and it is based upon a purely defensive policy. In reality the duty of the 90,000 North African Natives, 85,000 Colonial Natives, 18,000 Foreign Legionaries, and 11,000 irregulars, is to protect the French foreign possessions. In addition, 30,000 French officers, N.C.O's and 24,000 yearly recruits will serve overseas. This reduction made, we find only 352,000 men left in the Home Country from which have to be deducted half a contingent, not fully trained, amounting to about 120,000 men. It results that France will have to cover a land frontier of nearly 500 miles, with little more than 200,000 men; this is not out of proportion.

A compulsory service lasting a year should provide France with the 240,000 men needed. This figure is to be obtained as follows: according to the male birth rate, and admitting that the military returns of a yearly contingent equal 63 per cent. of the births, and, on the other hand, taking into account the inevitable wastage and the contingent required by the Navy, each class should provide, up to 1934, an average of 255,000 men. From 1934 and up to 1940, France will pass through a critical period owing to the deficiency in births during the last war. It is reckoned that the annual contingent for the Army will drop to 226,000 men in 1934, 145,000 men in 1935, 112,000 in 1936, to rise again to 122,000 in 1937, 141,000 in 1938, 160,000 in 1939, and 260,000 in 1940. To pass over that critical period, the Bill states that the men will be called up, from now on, at the age of 21 instead of 20, so as to reduce the effectives of the forthcoming contingents, and that they will, later on, during the critical period, be called to the colours at the age of 20 and even 19½. It is hoped with this scheme that it will not be necessary, at the said period, to lengthen the term of service as more than half a contingent will be called every six months.

The figure of 90,000 North African Natives represents 0.96 per cent. of the native population of Algeria, and 0.92 per cent. of the native population of Tunisia. Fresh Laws will regulate the recruiting system in Northern Africa and in the Colonies.

These effectives will, however, only be sufficient, if the soldier is not taken from his proper military duties. In consequence, the Law provides for the development of a body of civil servants called "*Agents militaires*," created in 1926. These "Agents militaires" will deal in

the units, centres of mobilization and services of the army with everything appertaining to mobilization and the storage of war material. Their number is to be increased up to 15,000. Moreover, all manual work not relating to mobilization will be done by civilian labour. The number of people so employed will be increased up to 30,000 so that 12,000 are still to be recruited. Besides, to relieve the army from any police duties, the strength of the mobile Republican Guard will be brought up to 15,000 men.

Moreover, as the worth of an army lies entirely in the quality of its cadres and as with the yearly compulsory service, it is difficult to recruit good N.C.O's among the contingent, the recruiting of long service men should be intensified so as to select from them the necessary N.C.O's and tradesmen. The Law provides for 106,000 long service men. As their present number is only 75,000, 30,000 more will have to be recruited. This question is moral as well as financial, that is why, besides the provisions of the Recruiting Law, a special Law dated 30th March, 1928, improves the N.C.O's status. Among other things the Recruiting Law states that all candidates to any lower functions of the State, the Departments, the Communes, or railways, will have to accomplish one year more service than the required compulsory term. It is expected that this will prove a stimulus to the recruitment of voluntarily enlisted men.

All these conditions will have to be fulfilled before compulsory service can be reduced to a year. The Law states that everything should be ripe for the new system to work on 1st November, 1930. If, however, things do not come up to expectation, the application of the said system will be postponed.

After having served one year with the Colours, every Frenchman will belong for the following three years to the "*Disponibilité*"[1]; then for sixteen years to the first reserve, and lastly for eight years to the second reserve. They will be free from any duty after twenty-eight years. No man will be exempted from serving except those physically incapable. Exemptions led to abuse in the past; from 10,000 men exempted in 1923, the figure rose to 60,000 in 1926. Separation allowances will be paid to all necessitous families. The "Disponibilité" is the first link in the chain of reserves. Its effectives constitute the Covering Forces, and, should circumstances warrant it, the Secretary of State for War can call it to the colours—partly or as a whole. In such cases the Government have to bring it, as quickly as possible, to the notice of Parliament. As for the Reserves, the first may be called up, in case of necessity, by Command, District, arm or branch of the Service, but

[1] Men of the French "*Disponibilité*" are in a similar position as those belonging to Class "A" of the Army Reserve (British Army).

always class by class, starting by the youngest. In case of aggression or threat of such, characterized by concentration of armed troops along the French frontiers, the men belonging to one, several, or the entire classes of the first reserve of a specified Command may be called up by arm or branch of the Service. The same applies to the second Reserve, but here men may besides be called up individually.

The training periods which every man having left the Colours is compelled to undergo are :

(1) Four months, in all, for the officers ;

(2) Three weeks for the men belonging to the " Disponibilité " ;

(3) Two periods of three weeks each and a third lasting from two to three weeks, to be fixed by the yearly Finance Bill, for the men of the First Reserve.

As a rule, the training periods are to be spent in organically self-contained units. The men belonging to the Second Reserve have to do special training periods not lasting more than seven days. The Government may keep the Reservists with the Colours longer than anticipated should the circumstances warrant it.

Frenchmen residing in the Colonies have to serve with the Colours as those in the mother-country, and serve in the units located in their residence, except when there are no available troops. In the latter case they are not compelled to serve. The same applies to Frenchmen born abroad outside Europe or the Mediterranean countries and to Frenchmen born in France, but living in the above countries, if they have left France before the revision of the annual contingent to which they belong.

Frenchmen born in foreign countries and possessing a double nationality, as is often the case in America, are not compelled to serve if they can show that they have served in the country of their adoption or that compulsory service does not exist in that country. This stipulation was made with a view to keep to French citizenship young men who might otherwise be incited to lose it if they had been compelled to serve in France.

A yearly compulsory service will, according to the forecast of the Select Committee on Estimates, cost 460 millions francs (about £3,680,000) more than an eighteen months, compulsory service, but this expenditure would have been in any case necessary, had the eighteen months' service been kept as such, as it was, it was far from safeguarding the country in a satisfactory manner.

THE MILITARY ACADEMY AT WEST POINT, U.S.A.

(By permission of the General Staff.)

1. *Purposes of the Academy and type of officer required.*—The purposes of the Academy as defined by the superintendent (corresponding to our commandant) "is to give all cadets a broad general conception of all branches of the service. This training is elementary, fundamental and general (note the powerful adjectives). The tactical work is not intended to produce either a drill sergeant or a subaltern qualified for one particular branch." Quoting again from the superintendent, the type aimed at is as follows: "Changed conditions since the war require modification of the type of officer. He will require all the cardinal military virtues as of yore but in addition must possess an intimate understanding of human feelings and a grasp of world and national affairs."

The fact that the American officer in war as well as in peace is largely required as an instructor for civilian or semi-military organizations is fully recognized and is stressed throughout the course.

2. *The nature of the course.*—In order to achieve these purposes a course of four years is planned, for the first eighteen months of which the cadet has practically no leave while throughout the course the holidays are few and the hours are long. The course still retains a large proportion of the engineering subjects from the days when it was primarily an engineering college and in this respect is designed to cover the same ground as the first three years of a university engineering course.

3. *Syllabus of instruction.*—The subjects to be taught, proportion of hours allotted to them and the methods of instruction are the subject of much thought and constant discussion.

At intervals of five years an influential committee is formed to investigate very thoroughly the whole system of West Point and to introduce changes where necessary. In a similar manner the co-ordination of the various subjects which are inter-related is very carefully arranged. It is interesting to note that during the last ten years, the amount of time devoted to cultural subjects such as Government, European History, Economics and Languages has been increased by 100 per cent.

4. *Staff.*—With the financial resources that are available it has been possible to provide West Point with an extremely large staff. There are no less than 200 military and civilian instructors for an establishment

of 1,300 cadets. The average size of a class seldom exceeds fifteen with the excellent result that a great deal of individual attention can be given to cadets.

The selection and training of instructors, both as regards the subject they are to teach and in educational psychology, still leaves much to be desired. Officers are apt to be selected as instructors purely on their former record at West Point without much regard to the qualifications essential for such posts.

5. *The Cadets and their selection.*—Cadets usually enter the Academy between the ages of nineteen and twenty-one. The size of entry varies from 200 to 250. West Point is fortunate in being able to have a very large field of selection, and there is great competition to be admitted to the Cadet College. There are two reasons for this: first, the West Point graduates have an excellent reputation with regard to their knowledge, character and ability in the outside world and those who leave after their four years of obligatory service as an officer are sure to be employed. Secondly, parents are anxious to avail themselves of the thorough education and strict discipline for their sons.

Differences in the social prestige attached to various occupations are not so marked in U.S.A. as they are in England, but, taking this into account, the social status of the Army officer is not so marked as it is here. The Army is not a money-making profession, and it is West Point itself rather than the subsequent military career which is the attraction to parents.

The vacancies for West Point are distributed throughout the various States of the country with the exception of a few nominations reserved for the President.

Of any batch entering the Academy, only 50 per cent. have passed an entrance examination, with the result that, amongst the remainder, there is a very high percentage of failure. In the former days some 40 per cent. of cadets failed to complete the four years' course. It is hoped now to reduce this percentage to about 25.

Cadets join from all States and are very varied in their manners and social status. Parents include chiropractors, cooks, capitalists, icemen and detectives, etc. A "powerful machinery" exists for converting this strange collection of human beings into a smart body of cadets in a very short while. On their first day they are barbered, photographed, given a book of customs and a first suit of uniform.

The book of customs, known, as the Plebes Bible, contains, amongst other peculiar items, instructions with regard to "Appearance and Carriage," the mass production of standardized cheering during athletics and a piece of poetry entitled "My Mother's Words."

The cadets themselves are extremely smart in their movements, beautifully turned out in the old blue-grey uniform, very well mannered, neither shy nor over-bearing and willing to talk fairly intelligently on a great number of subjects.

6. *The buildings, etc.*—West Point is beautifully situated, and although it is little more than 100 years old, it has much of the atmosphere of an old English university, not only in the style of the buildings, the trees and the well-kept lawns, but also in the spirit of the place which lays such constant stress on its history and traditions.

The buildings of West Point are on the most lavish scale. The laboratory and class rooms are very well fitted, and they own what must be the biggest riding school in the world, where indoor polo is played by many of the cadets during the winter months.

7. *Life at West Point.*—There is a very strict code of honour in the Academy. In fact, it is somewhat too rigid and rather recalls in some ways the pre-war German universities where courts of honour sat to decide on nice points of conduct and procedure. At the same time, it has its good side and the cadets are trained never to evade the truth or to dishonour the Academy, and offences against the code of gentlemanly conduct are rare.

The contact between officers and cadets is not sufficient. There are no platoon commanders in constant personal and friendly relations with the cadets as is the case in our own cadet colleges, but only one company commander for 200 cadets, and even he has little contact except in the orderly room.

No visitor should miss the Church Service which plays an important part in the life of a cadet. It is a ceremony popular with parents and relations. The Service is opened by the choir of cadets, 100 strong, marching in fours up the centre of the church wearing their old-fashioned full-dress uniform of blue-grey and gold, and singing the West Point Hymn. The Service is short—since the religious side is subservient to the idea of making a good American and a good " West Pointer."

Leisure is extremely lacking and the system of discipline is complicated and mechanical. A code which lays down a number of minor offences with the precise demerits allotted to each is rigidly adhered to, with the result that many cadets spend most of their time endeavouring to avoid demerits, whether for their work or for conduct.

Athletics, which include wrestling, golf and a very excellent indoor game, basket ball, are taken very seriously. There are many instructors, much apparatus and a permanent masseur. Every cadet is bound to take up a number of games, including golf and tennis, before he is

allowed to specialize in any one. On reaching this stage he goes in for intensive training, which includes separate diet at a separate table.

8. *The instruction.*—A most interesting feature of the course is the attention now paid to cultural subjects. These include European history, English literature, the modern drama, and an " Introduction to Contemporary Civilization." This latter course is intended to give a brief summary of the important political, national and economic problems of the world. It includes a very brief history of the development of society, the culture of various nations—the arts, thoughts and knowledge of to-day. In addition, the daily reading of certain sections of the " New York Times " is made obligatory.

9. *Methods of instruction.*—With regard to educational method the work at West Point is in accordance with the best modern ideas, but it is apt, in practice, to be too mechanical. Classes are small; every cadet is called upon to speak on the subject of his work at least two or three times a week. Classes are graded according to the intellectual and educational attainments of the various cadets. Moreover, they are required to do considerable reading, and in general two hours of private study are allotted to every hour of lecture. The system is such that no cadet can be idle since he is required to speak or write throughout the course on what he has learnt.

On the other hand, the hours are very long and instructors are apt to pay attention not to the teaching nor to illuminating the subject and interesting the cadet but merely to marking them for their work, while the cadets themselves are apt to stick too closely to the precise outline laid down without much thought round and about the subject and to concentrate on avoiding demerits. A good feature of the course is that an opportunity is given to all cadets towards the end of their time to offer serious criticisms on the subjects and methods of instruction.

10. *Changes in the future.*—Important changes which are foreshadowed in the future are as follows: (i) Greater care in the selection and especially in the training of instructors; (ii) The daily life and system of teaching to be made more human; (iii) More attention to be paid to general basic education which is designed " to equip a cadet for citizenship and to stimulate his interest in intellectual pursuits "; (iv) The introduction of psychology into the syllabus; (v) An increase of time for private study; (vi) An increase of time allotted to " contemporary civilization."

THE INTERNATIONAL SITUATION

UNITED STATES' PROPOSALS TO "OUTLAW WAR"

THE exchange of views between the U.S.A. and European States concerning the conclusion of a Treaty "renouncing war as an instrument of policy"[1] advanced so far that, in the early part of the year, Mr. Kellogg, the American Secretary of State, placed a Draft Treaty before the various Great Powers. On 27th April, this draft was accepted, without reservation, by the German Government in the belief that it did not run counter to the obligations imposed by the Covenant of the League of Nations or by the Locarno Treaty. Italy and Japan followed with expressions of approval.

The British reply came later, and stated that the Government warmly approved of the American proposals, but expressed the desire that certain doubtful points should be made clear, the most important of those points being that the right of self-defence must be recognised; further, that, in the event of any signatory being attacked, the said State should be exempted from all obligations entered upon towards the assailant under the proposed Treaty. France made certain objections which needed further discussion.

On 28th April, Mr. Kellogg made a speech at Washington before the American Society of International Law in which he answered the French objections as follows:—

(1) He asserted the inalienable right of self-defence possessed by every nation; so obvious did he hold this to be that he did not consider it needful to allude to the matter in the Treaty;

(2) The League Covenant imposes no obligation to go to war; it only permits it under certain conditions;

(3) The Locarno Treaties contain no pledge to take up arms, except where one signatory has broken its pledges towards others. Should the great Powers all sign the present Treaty, the situation remains unchanged;

(4) If France is committed to the protection of certain smaller states, and the latter, together with their neighbours, all sign the Peace Treaty, the situation once more is unaffected by that Treaty.

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[1]The earlier stages of these discussions were outlined in the JOURNAL for February, 1928, pp. 145–148.

He subsequently stated that he had reason to hope that the Treaty would be signed in the first instance by the six Great Powers: the United States, Great Britain, France, Germany, Italy and Japan; many other lesser States, he conceived, would follow that example.

This statement cleared the air with the exception of the proviso put forward by Sir Austen Chamberlain, on behalf of Great Britain, in which our Foreign Secretary claimed that certain areas of the world "constitute a special and vital interest for our peace and safety. The Government have been at pains to make it clear in the past that interference with these regions cannot be suffered. Their protection against attack is to the British Empire a measure of self-defence. It must be clearly understood that the Government in Great Britain accept the new Treaty upon the distinct understanding that it does not prejudice their freedom of action in this respect." It has been surmised that this statement refers to Egypt and parts of Asia, on much the same principle as the United States claim their right to act in the Western Hemisphere under the Monroe Doctrine, especially in the Panama zone.

Meeting these various objections by means of the insertion of apposite clauses in the Preamble, Mr. Kellogg has now caused the Draft Treaty to be circulated to the Governments concerned. The number of proposed signatories is now raised to fifteen, namely: the U.S.A., Great Britain, India, Irish Free State, Canada, Australia, New Zealand, the Union of South Africa, France, Germany, Italy, Japan, Belgium, Poland and Czechoslovakia.

In the covering dispatch the United States declare themselves prepared to sign the proposed Treaty at once in the form now re-drafted and the fervent hope is expressed that the Government of Great Britain and of the Dominions will be able "promptly to indicate their readiness to accept without qualification or reservation" the form of Treaty now suggested.

In conclusion, confidence is expressed that if the fifteen States above mentioned conclude this anti-war treaty among themselves, the other nations of the world "will gladly adhere thereto."

The three Articles of the Draft Treaty, headed by the Preamble, now read as below. It begins by enumerating the High Contracting Parties and continues by stating that they being . . .

"Deeply sensible of their solemn duty to promote the welfare of mankind; persuaded that the time has come when a frank renunciation of war as an instrument of national policy should be made, to the end that the peaceful and friendly relations now existing between their peoples may be perpetuated;

"Convinced that all changes in their relations with one another should be sought only by pacific means and be the result of a peaceful and orderly process, and that any signatory Power which shall hereafter seek to promote its national interests by resort to war should be denied the benefits furnished by this Treaty;

"Hopeful that, encouraged by their example, all the other nations of the world will join in this humane endeavour and, by adhering to the present Treaty as soon as it comes into force, bring their peoples within the scope of its beneficent provisions, thus uniting the civilized nations of the world in a common renunciation of war as an instrument of their national policy;

"Have decided to conclude a treaty, and for that purpose have appointed as their respective plenipotentiaries: . . . Who, having communicated to one another their full powers, found in good and due form, have agreed upon the following articles:—

"ARTICLE I.—The High Contracting Parties solemnly declare, in the names of their respective peoples, that they condemn recourse to war for the solution of international controversies, and renounce it as an instrument of national policy in their relations with one another.

"ARTICLE II.—The High Contracting Parties agree that the settlement or solution of all disputes or conflicts, of whatever nature or of whatever origin they may be, which may arise among them, shall never be sought except by pacific means.

"ARTICLE III.—The present Treaty shall be ratified by the High Contracting Parties named in the preamble in accordance with their respective constitutional requirements, and shall take effect as between them as soon as all their several instruments of ratification shall have been deposited at . . ."

It now seems probable that this draft, or another very closely resembling it, will be signed in the autumn by the Great Powers. The Secretary of State for Foreign Affairs has stated, on behalf of Great Britain, that the modified Preamble is satisfactory, and has expressed his readiness to sign the Treaty on behalf of his Government.

U.S. MERCANTILE MARINE POLICY

THE Mercantile Marine Bill, based on a measure which was passed earlier in the session by the Senate was passed by the House of Representatives on 5th May. The Bill makes very substantial provision for aid to private shipbuilding enterprise. It increases the construction fund at the disposal of the Shipping Board from £25,000,000

to £50,000,000, and authorizes loans from it for new ships at low rates of interest. The Shipping Board is authorized to remodel and improve vessels for competition in foreign trade. There are to be mail contracts for periods of ten years at rates varying from 6/- to £2/8/- per nautical mile, depending on the size and speed of the ships concerned. The Mercantile Marine Reserve is to be further developed. The President is empowered to commandeer ships during any national emergency.

On the question of the sale of Government vessels to private interests, the Senate proposal necessitated a unanimous vote by the Shipping Board in each instance, whereas the House of Representatives prefers to allow sales to be authorized by the vote of five out of the seven members of the Board. President Coolidge has already said frankly that even the latter proposal will make it too difficult for the Government " to get out of the shipping business," and it is possible that he may veto the measure unless sales are made possible on a majority vote.

Rear-Admiral W. L. Rodgers, U.S. Navy (Retd.), writing in the July number of the *Journal of the Naval Institute: Proceedings*, says: " We should not rely on other nations—on England and Germany—to do our carrying for us, as they like to advise us to do. . . . They are in the most intense economic rivalry with each other and with us ; jealous of our business success . . . If we allow them to do our ocean transport for us, we shall pay too heavily for it . . ."

" Similarly, we must not permit our rivals to have exclusive sea power and then expect them to let it work for our advantage instead of that of the possessors. This is the reason why Congress maintains a Shipping Board to run a merchant fleet which, as our foreign friends like to point out, is run at a loss. But the loss is apparent only, as an advertisement seems an expense. Congress makes up a deficit each year on the operations of the Fleet Corporation, but nevertheless the advantage to the general business of the country which we derive from carrying our own merchandise with our own carriers at reasonable rates is so great that it amply repays us by making a great volume of foreign business for our factories "

There is much else of interest in this illuminating article, which is entitled " American Naval Policy and the Tri-Power Conference at Geneva, 1927." Admiral Rodger's summary of and comments on the Conference are, to say the least of it, very one-sided.

One thing, however, is evident. The 'big navy' party want to see an American Mercantile Marine, which will wrest from Great Britain a large proportion of her business as the principal ocean carrier of the world, while they are fully alive to the value of the fleet as a commercial asset

in giving a powerful sense of security to merchant shipping and to those who charter it both in peace and in war.

The lesson for us should be obvious.

RECENT EVENTS IN CHINA.

A GREAT CHANGE

Recent events which have occurred in China, between the Yangtze River and the Great Wall, have been of profound importance to China and the Foreign Powers.

The brief, decisive and relatively bloodless Nationalist campaign has already been completely and fully reported in the Press. Nevertheless, in order to understand the present situation it is necessary to recapitulate its main incidents. The situation north of the Yangtze at the end of April was as follows :—

1. The Nationalist armies under Chiang Kai-Shek had advanced up the Tientsin-Pukow Railway to a point within striking distance of Tsinan, with flanking columns to the East and West. This advance was being opposed by Sun Chuan-Fang's forces, supported by those of Chang Tsung-Chang. Sun Chuan-Fang had suffered severely and was retiring northwards.

2. Further to the West, the advanced troops of Feng Yü-Hsiang on the Peking-Hankow Railway about the Chihli-Honan border had been engaged by the Northern troops, resulting in a minor check to Feng's men.

3. To the North-west, the troops of Yen Hsi-Shan from Shansi Province were in contact with Feng-Tien advanced troops about the junction of the Shansi railway with the Peking-Hankow railway at Shih-Chia-Chuang (near Cheng-Ting Fu), and in the extreme North-west at Kalgan. No fighting of any importance appears to have taken place on this front.

4. The Japanese, anxious for the safety of their nationals in Shantung and of their large interests in that Province, had despatched 5,000 men from the 6th Division, with telegraph and railway units, to Tsingtao and Tsinan, and to protect the Shantung railway, 250 miles long, between these two places. Three infantry companies had also been despatched from the Japanese North China garrison at Tientsin to Tsinan.

5. The bulk of the Feng-Tien armies were being held in reserve about Peking.


MONGOLIA
Mukden
MANCHURIA
Kalgan.
Jehol
Suiyuan.
Paotow.
PEKING
Tientsin
Gulf
Dairen.
Port Arthur.
ToSin-Kiang
Ma-Chuang
Takū
Chihli
Wei-hai-wei
Paoting
Tsang Chou
Chengting fu.
Te Chou
SHANSI
Yellow R.
Tsinan.
SHANTUNG
Tsingtao
KANSU
SHENSI
Cheng Chou
Lunghai R'y
Tungkwan
Hsü Chou-Fu
HONAN
Pukow
NANKING
SHANGHAI
SZECHWAN
Wanhsien.
HANKOW
Yangtsze
Hangchow
Chengtu.
HUPEH
Kiukiang
Ningpo
Yangtsze
Nanchang
CHEKIANG
Changsha
KUANGSI
FUKIEN
Foochow
KWEICHOW
HUNAN
Shiuchow
Amoy
KWANGSI
West R.
KWANGTUNG
CANTON
Swatow
FORMOSA
HONG KONG
Miles
0 50 100 200 300

CHINA, 1928.

During the month of May the situation developed with a rapidity which must have astonished most observers. Examined from a European military standpoint the position of Chang Tso-lin at Peking would have been regarded as highly critical after he had lost possession of the important strategic points of Hsü Chou Fu in Northern Chiang-Su and Cheng-Chou in Ho-nan, the respective junctions of the Lung-Hai railway with the Tientsin-Pukow and Peking-Hankow railways, since the way was at once left open for a combined Nationalist advance against his rail communications with Manchuria.

A military situation in China cannot, however, be judged by European standards, since the uncertainty of the spirit of the troops on either side and of the support which nominally allied commanders will afford each other are factors which may at any moment confound all forecast. In any case, Chang Tso-lin, after the loss of Ho-nan and Chiang-su, maintained his position about Peking, seemingly unperturbed, and accepted the risk to his communications, confident that combined action on the part of the Nationalist armies was a factor which might be ignored until his line of retreat was in very much more imminent danger.

The last days of April and the early days of May saw the evacuation of Tsinan by the Northern forces, and its occupation by Nationalist troops, which, significantly enough, were the same troops that were responsible for the disorder at the capture of Nanking a year previously. These were doubtless reinforced by a large number of the bandits, who for years past have over-run the province of Shan-tung in ever increasing numbers, and who would be attracted by the prospect of the conditions which have followed the occupation of many important cities by the Nationalist forces. The Northern evacuation was carried out without disorder, but shortly after the entry of the Southern troops the indiscipline of the troops was manifested and looting and indiscriminate shooting began. Japanese property was looted and Japanese subjects murdered in circumstances, according to Japanese statements, of great brutality. Defences were erected around the foreign quarter, and Japanese troops in protecting their nationals came into contact with bands of Southern troops.

JAPANESE INTERVENTION

These disorders occurred on the 3rd May. General Fukuda, who was in command of the Japanese troops, was able to report that on the morning of the 4th May fighting had ended, and that, by arrangement with Chiang Kai-Shek, the Japanese defences had been removed. Looting and sniping were, notwithstanding, resumed, and General Fukuda forwarded to Chiang Kai-Shek on the 7th May a list of demands, including (*a*) the withdrawal of the Southern forces to a distance of seven

miles on either side of the Shantung Railway; (*b*) the punishment of the Chinese commanders responsible for the murder of Japanese in Tsinan; (*c*) disorderly Chinese troops to be disarmed; (*d*) cessation of anti-Japanese demonstrations. This was accompanied by a twelve hours ultimatum.

It appears, however, that in the meantime, Chiang Kai-Shek had left Tsinan, and, in the absence of any acceptance of the ultimatum and in view of the continued disorders, General Fukuda took active measures to restore order, and to ensure the safety of a number of Japanese residents who were inside the walled city of Tsinan. Some 6,000 Southern troops remained in the city refusing to leave, and on the 9th May, General Fukuda commenced a bombardment of a part of the city. The surrender of the Chinese troops quickly followed, and all were disarmed. Cleaning-up operations seem to have continued until the 12th May, when the Chinese Chamber of Commerce informed the Japanese headquarters that there were no armed Chinese troops left in Tsinan. The Japanese Consul-General reported that the Japanese had buried 1,040 corpses of Chinese soldiers, while it was believed that the Chinese had buried 1,000 more. Japanese casualties during the operations amounted to 46 all ranks killed and 195 wounded, and, in addition, 14 civilians killed and in some cases mutilated. If the total estimate of Southern troops killed is correct, they would seem to have suffered pretty severely at the hands of the "dwarf slaves," as the Chinese students term the Japanese in their anti-Japanese propaganda. If, moreover, anarchy should unhappily continue in China, the lesson which the Chinese have learnt at Tsinan may not be without a salutary effect should a situation similar to that at Tsinan again arise.

General Tan Yen-Kai, speaking for the Nanking Government, has issued an appeal to the Governments of all States, and to the Council of the League of Nations, protesting against Japanese aggression at Tsinan, but it is not to be expected that, in the absence of any responsible head at Tsinan, and in view of the general disorganization of the Chinese arrangements there, he could be in possession of the full facts of the situation which arose between the 3rd and the 12th May. It cannot be denied that the presence of a Japanese garrison in Tsinan, for which there is no treaty right such as exists in Peking and Tientsin, added greatly to the risk of a serious incident, but the only alternative was to withdraw all Japanese nationals to Tsingtao, and to leave all Japanese property to the mercy of undisciplined Chinese troops and bandits. Few will now dispute the wisdom of the despatch of British troops to Shanghai, and when the Japanese troops are withdrawn from Shan-tung, there will be few who will blame her for taking the necessary steps to ensure the safety of her nationals.

While General Fukuda was dealing thus decisively with the disorderly elements in Tsinan, steps were being taken in Japan to reinforce the small garrison in Shan-tung. On the 5th May four infantry battalions (2,000 all ranks) were despatched from Dairen to Tsingtao. These, together with an air unit, despatched from Korea, reached Tsingtao on the 9th May. By the 26th May an additional railway unit and the 3rd Division, less one infantry regiment at Tientsin, had arrived in Tsingtao. The whole of the Japanese force in Shan-tung, now amounting to about 15,000, was then placed under the command of General Yasumitsu, commanding the 3rd Division.

It appeared at one time probable that the incident at Tsinan might hold up indefinitely the Nationalist advance on the east front, the only front which seriously menaced Chang Tso-lin's position. Just prior, however, to the Nationalist entry into Tsinan, a portion of Feng Yü-Hsiang's force appears to have reached Te-Chou on the Tientsin-Pukow railway, about sixty miles north of Tsinan. From here they continued their advance up the railway until they established contact with the main Northern line of defence at Tsang-Chou, sixty miles South of Tientsin, which was held by somewhat demoralized Chihli-Shantung troops, thus maintaining the threat against Chang Tso-lin's rail communication with Manchuria. Either because of this threat, or through a desire to show a united front against possible Japanese demands in consequence of the Tsinan incident, Chang Tso-lin now issued a peace note, in which he emphasized once more his hatred of communism, deplored the desperate condition of the country, and called upon all, civil and military, to unite to save the State. The overture, however, met with no response from the Southern leaders, and it became apparent that the Peking-Tientsin area could only be saved from being the scene of severe fighting by the immediate retirement of Chang Tso-lin with his Feng-Tien troops into Manchuria. At this moment, Japan took the decisive step which virtually has for the time being put a stop to civil war, and removed the danger of possible further international incidents. On the 18th May the Japanese Government handed to both the Northern and Southern factions a manifesto in which it was stated that Japan would not tolerate civil war in Manchuria and that neither a defeated Northern Army nor a pursuing Southern Army would be allowed to enter the province. To Chang Tso-lin it was intimated that there would be no interference with the peaceful retirement of the Feng-Tien forces to Manchuria, and a hope was expressed that he would withdraw his forces from Chihli without delay. Chang Tso-lin's immediate answer was to the effect that his recently issued peace-note gave evidence of his desire for peace in Northern China, and that the issue lay with the Southern leaders.

THE DEFENCE OF TIENTSIN

Meanwhile preparations had been completed for the protection of the foreign concessions at Tientsin. The foreign garrisons total strength, according to foreign press reports, now amounted to:

Americans	3,700 all ranks;	12 aeroplanes; 16 guns.
British	1,500 all ranks;	2 guns.
French	2,000 all ranks;	14 guns.
Japanese	5,000 all ranks;	16 aeroplanes; 12 guns.
Italians	380 all ranks.	

A total of approximately 12,580 men, 28 aeroplanes and 44 guns.

The Japanese garrison included the three companies of infantry which had been despatched as an emergency measure to Tsinan and had returned by rail to Tientsin on the 18th May.

Since 1920 scarcely a year has passed in which defensive measures at Tientsin have not been necessary. On previous occasions it has been sufficient to limit the line of defence to the area of the Concessions, with a few posts at vulnerable points outside the foreign area. On this occasion, however, the foreign commanders appear to have considered it prudent to hold a more extended line of defence, and a line of seven miles distant from the city was occupied. From questions asked in Parliament, it would appear that there was a disposition in some quarters to regard this step as unjustifiable and that the line of defence should have been strictly limited to the area occupied by the Concessions. It was, however, laid down in the Peace Protocol of 1901, that no Chinese troops, except for a small Governor's bodyguard, were to be stationed within a distance of twenty Chinese *li* (seven miles) of Tientsin, and, apart from the military question of ensuring the security of the foreign Concessions, there was no way in the circumstances of enforcing this treaty provision except by occupying the area in question. In normal times the provision has not been enforced in recent years, but the foreign commanders have as unquestioned a right to enforce it as they have to insist on the maintenance of free communication between Peking and the sea. In any case, the decision of the foreign commanders saved Tientsin city, as well as the foreign Concessions from the fate which has in the past few years befallen so many important centres of industry in China.

During the latter part of May there had been a general pressure by all the Nationalist forces on Chang Tso-lin's front, showing a combined movement which had not hitherto been evident on the Nationalist side. On the North-west, pressure was being maintained by the Shan-Si troops on the Feng-Tien forces about Kalgan, but no serious fighting had taken place here. On the Western front, Shan-Si troops, with the assistance

of Kuang-Si troops, under General Pei Chung-hsi and reported to number 50,000 men, had captured Pao-Ting Fu. In the centre at Ho-Chien Fu, a Northern force refused to fight and retired, thus allowing Feng Yü-Hsiang's troops to advance without serious opposition. On the left Nationalist troops, said to number 150,000, had advanced up the Tientsin-Pukow railway and were threatening Tientsin from the neighbourhood of Ma-Chang. In these circumstances Chang Tso-lin, influenced at last by the advice of his own adherents, and helped towards a decision by the Japanese memorandum, invited the foreign ministers in Peking to meet him, and announced his decision to withdraw forthwith to Manchuria. On the 3rd June he entrained at Peking, and met his fate outside Mukden on the next day, when his train was bombed by supposed Southern agents. The withdrawal of the Feng-Tien troops was conducted in an orderly manner, so orderly indeed that it suggests an understanding with the Nationalist leaders. A brigade of Feng-Tien troops was left in Peking to maintain order under Nationalist safe conduct, and under a promise that they would be allowed to retain their arms on departure. The plighted word was, however, violated, supposedly under orders from Feng Yü-Hsiang, and they were disarmed and detained in Peking.

THE END OF CHANG TSO-LIN

With the death of Chang Tso-lin an old order has once more passed away. He is the last of the post-revolutionary representatives of the old type of Viceroy, and, without being a great or far-seeing leader in peace or war, he was reliable and honest, and, measured by Chinese standards, governed with justice. During an age when loyalty to a leader has been regarded as having a market value, Chang Tso-lin has, with one exception, retained so far as can be seen the loyalty and respect of his subordinates. The exception was the notorious Kuo Sung-lin, who was corrupted by Feng Yü-Hsiang, turned against his leader in 1924, and paid the penalty for what in Chang's eyes was regarded as the one unpardonable offence. During Chang Tso-lin's control of Chih-li Province order was maintained to a degree unknown in areas under Nationalist control, and all foreigners have reason to respect his memory for the comparatively peaceful conditions under which they were free to live in districts administered by him.

After Chang's withdrawal some intermittent fighting occurred between Chih-li and Shan-tung troops and the Nationalists to the East of Tientsin, but this soon ceased. The fate of these troops is uncertain, but it is probable that the remnants of the Northern Army inside the Great Wall will be incorporated into the Nationalist armies.

The air is now full of manifestos and projects for retrenchment and reconstruction. On the 12th June the Nanking Government made

public a manifesto to the Powers, the provisions of which included a demand for the withdrawal of all foreign troops from Chinese soil and the negotiation of new treaties based on equality and mutual respect. From the same source a manifesto was issued to the Chinese people promising sound administration, suppression of banditry, abolition of surplus taxes and disbandment of surplus troops. More to the point is a financial conference assembled at Shanghai on the 20th June by Mr. T. V. Soong, the Nationalist Minister of Finance. The members included bankers and business man and the terms of reference were: (1) currency reform; (2) management of foreign and domestic loans, with a view to improving the national credit; (3) taxation reforms; (4) revival of commerce; (5) reduction of national expenditure.

It is understood that the first result of the Conference was a form of ultimatum to the Nanking Government that no more money could be made available for military adventures.

THE PRESENT POSITION

Improved though the situation is, with one Government in China and no apparent enemy in the field, for Manchuria appears to be inclined to accept the Nanking Government as the Government of China, Nanking has yet to prove that it has the power to control the military leaders and to fulfil the promises made in its manifestos. It has been estimated that there are one and a half million men under arms in China. Each leader depends for his position on the number of men that he can retain under his standard. Most of the men are months, and in some cases years, in arrears of pay, and the only way of maintaining a shadow of discipline and holding them to their command is by periodical military operations which give a rival's area on which to live, also a rival's towns and villages to loot. Each leader sees in the ally of to-day a potential enemy, and unless he has accumulated a fortune sufficient to render retirement desirable, he is unwilling for very obvious reasons to reduce his following, even if he were able to do so without producing mutiny, as unpaid troops cannot be dismissed at will. If the military leaders could be induced to sink their ambitions for the good of the country, and disband their legions, they must have money from the Government to disband, but when military expenditure consumes the major part of the country's revenue, money cannot be forthcoming until military expenditure is reduced, and reduction can only be effected by disbandment. A vicious circle if ever there was one. Truly few Governments have been confronted with such a problem as the Nanking Government, and they merit much sympathetic consideration.

Whether China North of the Yang-tze river is to proceed along the paths of reconstruction or anarchy rests with the three chief leaders in

the field, Chiang Kai-Shek, if he elects to retain his command, Feng Yü-Hsiang, and Yen Hsi-Shan. Yen Hsi-Shan controls, besides his own province of Shan-si, North Chih-li, including Peking and Tientsin. Feng controls the provinces of Kan-su, Shen-si, Ho-nan, and at present South Chih-li, and is looking towards Tientsin in order that he may neutralize Yen's power in Peking. Chiang Kai-Shek holds An-hui, Chiang-su and Shan-tung. This, so far as can be gathered from reports, appears to be the present distribution, though some re-allotment of areas may take place ; as Feng was originally offered Shan-tung. Feng probably controls the best troops, as he has a genius, not common amongst Chinese, for organization. His position in Ho-nan, astride the Peking-Hankow Railway is one of great strategic importance, and he controls the Lung-Hai Railway, with secure, though long, communication through Shen-si, Kan-su and Sin-kiang with Russia, the country which has refused to sign an international embargo on the importation of munitions of war into China. Faithless to almost all his friends save one, and that his country's most dangerous neighbour, the pity is that he should be in a position to exercise so potent an influence on the future. The only hope is that, after all these years of anarchy, Tu-chüns (model) and Generals (Christian) and other military potentates will cease to regard themselves as their Country's deliverers from oppression, and leave deliverance for a period of trial in the hands of the civil administration.

NOTE.—Press reports at first indicated that Manchuria was disposed to acknowledge the Nationalist Government and that this condition might contribute towards its stability. It now appears that Japan has tendered advice to Chang Hsuch-liang (Chang Tso-lin's son and successor) not to accept Nationalist rule. Young Chang is reported as inclining to agree. Should this prove to be the case, the results may be of great importance, since it would show that the principal aim of Japan's policy in Manchuria is to preserve an independent Manchuria under Japanese protection. This effect would be :—

(*a*) To prohibit all Nationalist interference with Japanese treaty rights and interests in Manchuria ;

(*b*) To establish a " buffer " state between Japan and Russia.

FRANCE AND GERMANY: THE GERMAN STANDPOINT

> On a certain occasion in 1917, two French prisoners of war, fallen into German hands, were overheard discussing the merits of the British Army as an ally in the Great War. "Well," said one Frenchman, "when all is said and done, the Boches and ourselves are the only real soldiers worthy of that name."
>
> To which the other replied: "Yes; if we and the Germans could work together as allies, we could rule the world! But—NEVER!"

The above sentences are taken as a text by the *Militär Wochenblatt*[1] in reviewing an article, published by the monthly journal "*Pan-Europa*," dealing with the Franco-German problem and coming from the pen of Baron Coudenhove, the well-known advocate of the Pan-European movement.

The reviewer agrees with Coudenhove, in pointing out that, having regard to their history, there can never be any love lost between France and Germany. Nevertheless he is of opinion that some kind of *rapprochement* between them is inevitable, since another war must entail the virtual annihilation of Europe. Moreover, in view of the menace to European industry which is impending from the United States some form of European union is now growing inevitable. A possible line of action should, therefore, be found in a compromise whereby France should obtain "security" whilst Germany must be granted "equal rights." Both writers admit that, should Germany be granted a release from all compulsory limitation of her armaments, France would immediately begin to feel herself threatened. The logical deduction is that it is France who must reduce her armaments.

The only road to this end, it is suggested, is to be found in some form of European unity. A Pan-European League, to which neither Britain nor Russia may be admitted, would consequently set about the disarmament of the countries belonging thereto. Admit for once that this League should be created and could demand a reduction of armaments from its adherents, is it not probable, so ask these writers, that the French would then point to their British neighbour who may scarcely be inclined to disarm in view of the dispersion of the states and possessions that compose her Empire, not to speak of her natural antagonism to the United States? Coudenhove would seem to advocate the formation of an inter-allied European Defence Force to repel exterior attack. But, thinks Amman, little reliance could be placed in such a creation, for the weaknesses inherent in all Allied armaments, when faced by true national forces, are

[1] No. 41, for 4th May, 1928: "Germany and France," by Major General von Amman.

too well known. In addition, science and industry now count for so much in military activities that the supply and employment of an army composed of several different nationalities might present growing difficulties.

The question thus arises: who will be strong enough to assume the political leadership in such a combination, and thereby secure a solution of the disarmament and other problems facing such a League? The record of the German Confederation of last century is adduced to show that it was not until 1866 and 1870, when the question of leadership had been solved by war, that the advantages secured by joint action could finally be exploited. In yet another manner, adds Amman, the United States provide a further illustration of the fact that it required four years of civil war to bring about effective union in a nation that was not divided by race, tradition nor language. How much greater then are the obstacles to European unity.

But the fact remains that, in the face of the economic challenge of the United States, some form of unity must be achieved. If this is not to be attained by purely voluntary means, two roads leading to this end appear open.

The first is union by conquest such as a Napoleonic genius might achieve. The second is the slow growth of a League which should gradually crystallize itself out round an original smaller nucleus. The former can nowadays and for a variety of reasons be ruled out. There remains the second alternative. The nucleus for such a creation can only be found in the secure military and economic alliance of two of the strongest European Powers. These can only be France and Germany. In this case the necessary premise must be: "Equal Rights for Germany."

Now the conditions which, in German eyes, are indispensable for any realization of that plan are:

(*a*) The termination of foreign occupation of German soil, a growing source of national shame to Germany;

(*b*) The "Polish Corridor" must be abolished, since it constitutes a lasting thorn in the flesh, whilst it is ruining that cradle of the German State, East Prussia;

(*c*) The Disarmament obligations must be revoked, for these constitute a bond incompatible with the sense of sovereignty of a great nation.

In return, Germany must enter into such obligations as are requisite to safeguard France and satisfy French sentiment as to her "security." Germany must undertake not to prepare any armaments beyond a standard fixed in such manner that these would still remain inferior to the French, whilst satisfying the principle of "equal rights" for herself.

Should such a military and economic alliance come about, it might require only economic pressure to bring all other central European States to join that union.

It is then argued that before such an alliance could come about there must take place a total change in French politics. It will require a great statesman to direct France on to a course which will lead her to approach Germany with a view to winning over a great ally in place of the hereditary foe—and so strengthening herself to face future dangers.

To such proposals it is not improbable, so think both these writers, that the word " Never " will echo from across the Vosges. But Germany as the vanquished side, still bound hand and foot, could make but little advance in that direction. In Germany, too, the pacifists are still cringing to the former enemy ; they are not only attacking the remnants of German armed might, but are even decrying any national desire for self-defence. France doubtless approves and may even support them, forgetful that a nation, which has sunk to the level of giving up all hope of self-defence, is on the road to ruin—like ancient Greece. This fact would no doubt delight the Paris politicians. The more this pacifist tendency penetrates Germany, the more surely may French policy feel that she can reach her goal, that is, the security of the French domination of Europe—if not *against*, at any rate, *without* Germany.

If then the union of Europe is to be achieved, every German should attempt to keep alive a strong and generous desire to secure German independence and the right of self-defence.

Only thus, concludes Amman, can Germany hope to obtain the " equal rights " which even Coudenhove claims for her. Only thus will Germany regain her freedom, whether she attain this end, either on the side of future enemies of France—if the latter continues to reply " never " —or by means of a Franco-German alliance. But the latter seems the only practical road whereby any future and final settlement of Central Europe can and must be reached.

ANGLO-EGYPTIAN NEGOTIATIONS, 1927-28

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AFTER protracted negotiations extending over many months, the draft of a new Anglo-Egyptian Treaty was drawn up towards the end of 1927 by His Majesty's Government in collaboration with the Egyptian Prime Minister, Sarwat Pasha, who undertook to pilot this draft through his own Parliament. After an interval of laborious political manœuvre, in which the extremist or anti-treaty party always

appeared to have rather the upper hand, on 5th March, Sarwat informed the High Commissioner in Egypt th the atWafd and his Cabinet had finally rejected the proposed treaty. He thereupon tendered his resignation to the King, who had no course but to accept it.

At this juncture His Majesty's Government presented a firm note to the Egyptian Government emphasizing their adherence to the declaration of February, 1922. For a brief space exhibitions of hooliganism by gangs of irresponsible students took place in various centres in Egypt, but these were quickly suppressed, and the prevailing excitement died down. Finally, on 16th March, Mustapha Nahas Pasha, the President of the Chamber and leader of the Wafd, was entrusted with the formation of a new coalition Cabinet which proved to comprise eight Wafd and two Liberal members.

On 30th March, Nahas Pasha replied to the *aide mémoire* of 4th March, in which His Majesty's Government expressed their disapproval of certain legislative measures proposed by the Egyptian Cabinet, asserting that the interference of an outside authority was an unwarranted infringement of the rights of an independent nation, and ignoring the special position in which Great Britain stands in Egypt in virtue of the Declaration of February, 1922

On 4th April, in a public reply, His Majesty's Government refused to allow that Nahas Pasha's Note gave a correct exposition of the relations between the two countries, and reiterated their adherence to the Declaration of February, 1922, in which the independence of Egypt was declared subject to four reservations These were :

(1) The security of the communications of the British Empire in Egypt ;
(2) The defence of Egypt against foreign aggression or interference ;
(3) The protection of foreign interests in Egypt, and the protection of minorities ;
(4) The Sudan

It had been hoped that progress towards a solution of these four points would be made by the negotiation of a new treaty, but on the breakdown of the negotiations with Sarwat Pasha such hopes were dispelled. Consequently the *status quo ante* still continued with the reserved points remaining reserved to the absolute discretion of the British Government

The Egyptian Government withheld their reply, but towards the end of April the Cabinet, under pressure from the extremist members of the Wafd, proceeded with the passage of a Public Assemblies Bill, one of the measures to which exception has been taken by His Majesty's Govern-

ment on the ground that it would endanger the security of foreign nationals, for which they held themselves responsible under the Declaration of February, 1922.

In consequence, on 19th April a verbal warning was addressed to the Prime Minister by the High Commissioner, asserting the objections of His Majesty's Government to the Assemblies Bill. As the warning had no apparent effect, on the 29th April a written ultimatum was handed to the Premier, demanding the withdrawal of the Bill within seventy-two hours. Failing compliance, His Majesty's Government reserved the right to take such measures as it deemed necessary to meet the situation.

On 1st May, the Prime Minister, handed his reply to the High Commissioner, reiterating the Egyptian Government's view that they could not recognize Great Britain's right to interfere in Egyptian legislation. In consideration, however, of their desire to reach an amicable understanding the Egyptian Government undertook to suspend consideration of the Assemblies Bill until the next Session.

His Majesty's Government, in a further Note, accepted this assurance of the friendly sentiments of the Egyptian Government and noted the postponement of the Bill, but stated that if the Bill was reintroduced measures would again have to be taken to prevent its enactment. In addition, His Majesty's Government asserted that they could enter into no discussion respecting the Declaration of February, 1922, which they would not permit to be either modified or disregarded.

Since then the situation in Egypt has remained fairly normal. *

ANGLO-PERSIAN RELATIONS

On 26th April, 1927, the Persian Government notified the Powers, with whom Persia was in treaty relations of their intention to cancel existing treaties with effect from 10th May, 1928. The main objects in view were to ensure the abolition of capitulations and to obtain tariff autonomy.

While no specific mention of capitulatory rights had been made in the various Anglo-Persian treaties, Britain enjoyed "most favoured nation" privileges under the treaty of 1857. Thus the fact that other European Powers had obtained capitulatory rights dating, in some instances, from the sixteenth century automatically conferred similar rights upon Great Britain. Likewise the cancellation of all other treaties entailed the loss to Great Britain of such rights.

As the judicial system in Persia in no wise conforms to Western standards, the question of securing adequate protection for British

*Note.—This was written prior to King Fuad's recent dissolution of the Egyptian Parliament.

nationals was one which concerned His Majesty's Government very closely, and discussions on this subject were immediately opened with the Persian Government. For many months it seemed that Persia intended to stand on her dignity, but at the eleventh hour satisfactory assurances were received, and on 10th May, 1928, an important series of conventions was finally signed at Teheran.

Chief amongst these was an Anglo-Persian treaty regulating the commercial relations between the two countries. In this instrument, which has been concluded for a period of eight years, Persian tariff autonomy was duly recognized.

Pending the conclusion within a year of a full Treaty of Commerce and Navigation, arrangements for maintaining those provisions of existing Anglo-Persian treaties which do not limit Persia's right to settle her customs tariff autonomously, have been made by means of an exchange of notes. In addition, in view of the abolition of the capitulations, the Persian Government have agreed to apply an approved list of safeguards to protect the position of British nationals.

While the above conventions cannot by any means be held to have settled all questions outstanding between Great Britain and Persia, the way has unquestionably been paved for further negotiation on a reasonably amicable basis.

RAILWAY CONSTRUCTION

On 19th April, the Persian Government approved a contract with an American-German syndicate for the survey of 1,300 kilometres of the Trans-Persian Railway.

Authority was also given for the syndicate to construct short trial sections of railway at each end, and it was given an option for the construction of the whole line.

ARABIAN AFFAIRS

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Nejd.—In spite of innumerable alarmist rumours concerning threatened developments on the Iraq-Nejd frontier, no further raids have been carried out by the Wahabis into Iraq or Koweit territory.

The internal situation in Nejd has remained somewhat obscure, but there is reason to hope that Ibn Saud has succeeded in arresting any further deterioration of the situation within his own domains. The renegade Feisal ad Dawish has as yet made no move to compose his

differences with his King, but the latter has evidently been able to discourage the remainder of his tribes from making common cause with the Mutair.

In the meantime it can be said that a marked improvement in the Iraq-Nejd situation has set in. Ibn Saud notified his willingness to meet Sir Gilbert Clayton to discuss matters at issue between Nejd, His Majesty's Government and Iraq, and the meeting took place at Jeddah early in May. Further, in spite of rumours concerning the northward movement of Akhwan concentrations, there have been no further raids into Iraq or Koweit.

South-West Arabia.—The Imam of the Yemen was brought to a more reasonable frame of mind by our bombing of Kataba. Two captives, whose liberation had been demanded, were released by the Zeidis on 25th March. The Imam then made two separate moves towards re-opening negotiations with His Majesty's Government for a general settlement of questions at issue.

Threatened unrest amongst certain of his coastal tribes may have encouraged the Imam to change his attitude, but it is significant that, by sending his emissaries to Aden on the heels of our bombing operations, he undoubtedly laid himself open to the implication that he acted as a result of our pressure.

On 13th April, the Acting Resident at Aden left for Taiz, where he carried out informal discussions with the local Zeidi Commander.

As a result negotiations are now under way for the conclusion of a definite agreement between His Majesty's Government and the Imam.

In order to avoid protracted discussions His Majesty's Government have propounded a brief preliminary treaty which provides for:

(*a*) British recognition of the Imam's independence;
(*b*) Recognition by the Imam of the Aden Protectorate frontier; and
(*c*) A promise to the Imam of such assistance as His Majesty's Government can render him within the limits of their international obligations.

It is proposed that other outstanding questions should be regulated by a subsequent and more detailed treaty to be negotiated at a later date, after the Imam has actually evacuated his present encroachments into the Aden Protectorate.

In order to give the Imam time in which to deliberate these proposals the present truce was extended up to 17th July, on condition that the Zeidis withdrew from Dhala by 20th June as an earnest of the Imam's good faith.

(*See also* AIR NOTES, *page* 640).

CORRESPONDENCE

(Correspondence is invited on subjects which have been dealt with in the JOURNAL, *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, and publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.)

THE STAFF SYSTEM IN THE NAVY

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In an article published in the May JOURNAL, the author, Admiral Sir Douglas Nicholson, appears to condemn our Naval Staff system because it is Prussian in origin and military in character. He points to the failure of the great German General Staff in the late war and to the success achieved by the British Navy, in spite of there being no properly constituted staff at the Admiralty for a considerable period of the hostilities.

The reasons for the German failure were outlined by Rear-Admiral Dreyer in his article "History and Leadership in War,"[1] which seems to have escaped Admiral Nicholson's attention; while the justifiable praise bestowed by the latter on the work of the Navy afloat hardly dissipates well-known failures in the higher direction of the war at sea. These failures must be attributed very largely to lack of proper staff work. To quote a few examples:

(1) Before the end of 1914, five cruisers, an aircraft carrier and a battleship had been sunk, and the Grand Fleet was desperately insecure for lack of a base; all this was chiefly due to the fact that the capabilities of submarines had not been properly investigated by a naval staff before the war.

(2) Admiral Cradock and his two ships were lost at Coronel because the situation in the South Pacific had not been properly appreciated or the fighting capabilities of his command accurately analysed; again, elementary staff work was wanting.

(3) The failure to co-ordinate the British and French Commands in the Mediterranean and the confused orders emanating from the Admiralty to the former, were largely responsible for the escape of the "Goeben" and "Breslau" and the fateful consequences thereof.

(4) When war came the Admiralty had no properly thought out plan to lay before the Cabinet for checking seaborne supplies to the enemy, with the result that this, a vital part of the conduct of war at sea, passed into civilian and, worse still, into largely political and commercial hands, with the worst possible results.

(5) Naval staff work was conspicuous by its absence, when the Dardanelles Campaign was first mooted, with the result that the naval and military authorities did not combine to organise success and prevent failure through premature action.

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[1] R.U.S.I. JOURNAL, August, 1927.

(6) When war came the Navy was very deficient in mines, because the need for them had not been foreseen.

(7) The lack of development of naval air work and the failure to appreciate its importance, which eventually led to the loss of its Air Service, was a defect in staff work from which the Navy has not yet fully recovered.

One does not wish to dwell unduly on failures when, as both Admirals have remarked, the final issue brought us victory, but surely we ought to learn from our losses and not merely sigh for the good old days when there was time for the Admiral to stand alone in his glory and (perhaps) encompass the whole sphere of naval strategy, unaided.

Those days are long passed. The events of modern war follow so swiftly one on another; ships, fleets, to say nothing of aircraft, are so mobile; the balance may swing so rapidly from victory to defeat, from security to disaster; that we dare not rely on a "one man" system, or the heaven-sent inspiration of the moment.

Naval staff work may differ in certain particulars from Army staff work, even as sea warfare differs from land warfare, but the need for a staff is one common to all three Services. As Admiral Dreyer expressed it[1] "war has become more spacious and fighting more intricate," wherefore, to be successful a leader requires "a staff, trained to relieve him of the burden of detailed preparation and administration. . . ."

A staff does not detract from the authority of the commander, nor does it relieve him of the responsibility for important decisions and the direction of the main issue, but it does, or should, arm him with knowledge which it is humanly impossible for one individual to collect or assimilate by himself, and it provides him with machinery for preparing his plans and for giving effect to them in detail.

The Prussians were amongst the first to recognise the necessity for a staff system, but it does not follow that any and every staff system is to be condemned because it is Prussian in origin and, consequently, over-rigid—at any rate for the Navy—in practice. Incidentally, it may be noted that the victorious military command in the late war, which eventually became centred in a French generalissimo, functioned through a staff based on the Prussian model.

So far as the Navy is concerned, would it not be more fair to say that we emerged successfully from the greatest peril which has ever beset the Empire by sea because, in the end, the Admiralty and the fleet had built up the staff system which they lacked at the beginning?

Yours, etc.,

20th July, 1928. "STAFF WORK."

(*Attention is invited to the remarks on this subject made by the Chief of the Naval Staff at Major-General Ironside's lecture to the Institution on "The Modern Staff Officer," which will be found on page 447 of this number of the* JOURNAL.—EDITOR.)

[1] "The Birth of a Staff System," R.U.S.I. JOURNAL, February, 1928.

"1927 OR 527"

To the Editor of the R.U.S.I. Journal.

Sir,—In his article under the above title, in last quarter's Journal, Captain Liddell Hart seems to suggest that the Mongol armies were not "hordes"; but a reference to the origin of this word will, I feel sure, make plain that it was exactly applicable to them. It is derived from the Turkish "ordu," a camp, and thus comes to mean a nomadic tribe—not necessarily a big one. Besides the late Professor Bury, to whom Captain Liddell Hart refers, the late Dr. Hans Delbrück dealt with "numbers in history" in a series of lectures given at the London University in 1913. These lectures, published in pamphlet form, not only analysed the exaggerations of interested historians, but their deliberate falsifications in other directions—by which, often, the armies of their own country were reduced by half, and those of its enemies multiplied by ten, twenty, or even a hundred.

I do not understand what Captain Liddell Hart means, when he speaks of "mediæval infantry . . . acquiring" the pike. Even Æschylus, in his tragedy, "The Persians," celebrates the victory of the pike over the bow; although it is true that the Greek infantry, armed with the pike and shield, were lucky in the restricted area of their battlefield. The pike, in fact, was the primitive weapon of all foot soldiers in their dealings with horsemen.

Captain Liddell Hart repeats a former assertion of his, that "mediæval infantry" took care to fight only in "cavalry-proof localities"; but evidence for this assertion is lacking. A study of Froissart, or Machiavelli, will provide plenty of evidence to the contrary. Battles in which this infantry took part were not restricted to the tops of mountains, or the bottoms of bogs; but were fought on the plains of Europe, whereon arrays of pikemen, archers, or musketeers continually affronted an increasingly cumbrous chivalry. The "stupidities" of this chivalry were not, as Captain Liddell Hart seems to think, that they made "bull-like charges," and then, in despair, took to fighting on foot; the process was, if anything, the reverse. It was common practice, from the Norman Conquest, to at least the day of the Black Prince, for the commander of an army to set up his standard, and fight a defensive battle round it with his dismounted knights and squires. The so-called charges of later days, when missiles discharged by infantry had brought about the armour-plating of both man and horse, were made at a trot or walk. It became increasingly difficult to move these squadrons of mediæval "tanks"—which possessed no means of augmenting their motive power in proportion to their weight of armour. In the end, far from becoming "an inferior form of mounted infantry", they learned to cast their danoply, to improve their mounted manœuvre, and eventually to develop into cavalry proper—an arm depending for its main effect on mobility, surprise and shock.

As to Captain Liddell Hart's suggestion that many soldiers wish to have "something of everything" in the matter of weapons, this is a reasonable attitude, so long as there seems every possibility that our opponents will possess "much of everything." The concentration on "decisive superiority" in one thing alone needs not only a bottomless purse, but a very safe basket to carry all the eggs.

Space forbids me to examine Captain Liddell Hart's theories of the rise, decline and fall of the Roman and Byzantine empires; suffice it to say that I cannot see the cause of their progress or failure in the difference between the infantry sword and the cavalry bow.

Yours, etc.,

18th July, 1928.

A. G. Baird Smith,
Lieut.-Colonel (*Retd.*)

EMPIRE SETTLEMENT FOR THE RETIRED OFFICER

To the Editor of the R.U.S.I. Journal.

Sir,—The training curriculum now enforced in all branches of the Services is admirable for the man who at the end of his service desires to emigrate to our Dominions and a number of excellent fellows avail themselves of the Service Vocational Schools with a view to obtaining knowledge of the work they intend to follow in civil life. I suggest, however, that a scheme could be arranged whereby the commissioned officers of our Services would receive a period of vocational training at our Universities prior to their departure to civil life.

At first sight such a scheme may sound ridiculous, but if squarely faced it may not be found to be entirely impracticable. The average officer is retired at the age of forty-five years in the prime of his life. He almost invariably has the extra responsibility of providing for and educating a young family. I believe that the average man longs for the chance of starting life in the Dominions, but who will ship him and his family to these far distant lands? The result is that he is left to take his chance with the mass of the civil population with a small pension or gratuity, neither of which will provide him with the necessary funds to tranship family, bag and baggage, and leave enough with which to start a new home overseas. Yet this is the very type of emigrant which must be encouraged to fill up our vast Empire.

I further suggest that an attachment to the would-be settler's allied regiment in the Dominions would greatly help the future development of our Empire settlement.

This may mean extra money out of the training grant, but it would be money well spent. As Cecil Rhodes said: "Wherever there is room there is hope."

Yours, etc.,

Claude F. Webb,
Captain, The Manchester Regiment.

SERVICE FAMILIES SETTLEMENT SCHEME

The following official announcement has been received from the War Office :—

The conditions of a Land Settlement Scheme, under which special facilities are offered to a limited number of military and naval families, to settle on farms in Canada during the Spring of 1929, have now been agreed between the Government Departments concerned. Vacancies for thirty families are specifically allotted under the Scheme to the Army, and the names of families recommended by General Officers Commanding-in-Chief, are to be submitted to the War Office as soon as possible. It is not essential under this Scheme that both man and wife should have had previous agricultural experience. Generally speaking, the age of the head of the family should not exceed forty-one years, but where the family is regarded by the Canadian authorities as particularly suited for settlement, a man up to forty-five years of age will be accepted.

All accepted families will undergo a six months' course of training in agriculture at the Army Vocational Training Centre, Chisledon, beginning 1st November next. Wives and elder children will receive suitable instruction during the course. Lectures will be arranged by Commands to explain the Scheme in detail. The underlying object of the Dominion authorities is to place each family on a farm offering the best prospects of the early success of the family. All farms allotted are established in settled districts with a suitable house and land which has been developed at least partially. For these reasons the settlement of all families as a group in one district is impracticable ; but, so far as possible, small groups of four or five families will be settled in the same district, that is, with access to the same market town.

The cost of ocean passage for each adult settler will be £2 and the cost of the railway journey in Canada from £2 to £6, according to the distance of the destination. Children under seventeen travel free. In cases of necessity arrangements may be made for an advance of passage-money. A sum up to £300 is advanced by the Imperial Government to each settler for the purchase of stock and equipment, the loan being repayable in instalments spread over twenty-five years.

Command Oversea Settlement Committees will make arrangements for explaining the Scheme and for recruiting suitable families. A roll of men selected, with the names in order of priority of recommendation, is to be rendered to the War Office by 1st July next.

A similar communication has been made to the Navy in a Fleet Order :—

Ex-Naval and Marine ratings to the numbers of twenty are being offered the same facilities during the spring of 1929 as ex-soldiers. Accepted families will undergo the course at the Army Vocational Training Centre at Chisledon.

Men due for discharge who wish to take advantage of the scheme are directed to apply for a recommendation from their Commanding Officer and, on discharge, should join the local branch of the British Legion who will make the necessary arrangements for examination with the Canadian Authorities.

GENERAL SERVICE NOTES

R.N. STAFF COLLEGE.

Army Training.

It was announced in Fleet Orders on 6th July that arrangements have been made with the War Office whereby R.N. and R.M. officers qualifying at the R.N. Staff College will, in future, be attached for the period of a week to the headquarters of a command, divisional or brigade staff, during the collective period of Army training. During the present year, this period is between 3rd and 22nd September, 1928.

COMBINED EXERCISES ON THE EAST COAST OF SCOTLAND.

An interesting combined exercise was carried out on 4th June and following days by the Battle Cruiser Squadron, commanded by Rear-Admiral F. C. Dreyer, in conjunction with the 2nd Bn. Cameron Highlanders.

The general idea was as follows: "Northumbria," an imaginary State, comprising the Northern English and Lowland Scottish counties, was at war with "Caledonia," i.e., the remainder of Scotland up to the Caledonian Canal, North of which land was non-existent. The Northumbrian navy had scored a decisive success at sea, while the land forces of both sides were engaged on the line Forth-Clyde.

The special idea given to this detachment of the Northumbrian forces was a mission to destroy an aircraft factory supposed to exist at Gollanfield, situated between Nairn and Fort George. The fleet was ordered to support the attempt by bombardment from the sea.

On the afternoon of the 10th the Camerons marched from Edinburgh to Port Edgar in pouring rain. At the latter place they were conveyed in the ships' boats on board H.M.S. "Renown." General Sir W. Peyton, G.O.C.-in-C., Scottish Command sailed in H.M.S. "Hood."

On the evening of the 11th the battle cruisers joined the aircraft-carrier H.M.S. "Furious" and the Fifth Destroyer Flotilla off Golspie, on Dornoch Firth.

At the first sign of dawn on the 12th the disembarkation was timed to begin, zero hour being 2.10 a.m. The ships anchored at 9.30 p.m. on the 11th. Shortly afterwards H.M.S. 'Velox" came alongside and 200 men were taken on board. Three more destroyers followed, until the entire disembarking force, consisting of Marines and the Camerons, were clear of the battle-cruisers. The Northumbrian squadron then sailed at 10.30 p.m., heading for Nairn.

At 1.45 a.m. on the 12th the ships anchored noiselessly and the landing parties were once more transferred from the destroyers to a flotilla of ships' boats. The actual disembarkation was carried out in three flights. The first flight was soon ashore, although some few rifle shots showed that the operation was not altogether

undetected. The Camerons made good headway and rapidly established a covering line with Lewis gun posts. A second flight landed, and within an hour from the start a third flight was also ashore. The entire landing was supported by aeroplanes from H.M.S. " Furious." The operation was conducted according to plan ; the staff work proving very good, and the boat work equally satisfactory.

The remainder of the exercise calls for little further comment except for the little comedy that was enacted at Fort George itself. It had been arranged that, while the actual disembarkation was proceeding, a feint landing should be simulated near Fort George by three destroyers. Accordingly these ships proceeded to Fisherton, situated one mile to the west of the Fort, and made a good deal of smoke and noise. Under cover of this " demonstration " two whalers filled with bluejackets, came in under the Fort, which being found unguarded, was rushed. This episode brought the exercise to a close.

On the following day, the 13th, a fresh exercise was carried out. It had been arranged that the fleet should transport the Black Watch, stationed at Fort George, to Invergordon by sea. The object of this was to convey the troops to a point on the Firth of Cromarty, whence they could march to their summer camping ground near Tain. Embarking off the beach at Fort George at 5.30 a.m. the entire troops and baggage were set ashore on Invergordon Pier by 9 a.m., after acquiring most useful experience.

A COMBINED EXERCISE ON THE SOLENT.

A joint naval, military and air force exercise was carried out on 16th June in Stokes Bay, on the Solent. From the battle cruiser " Tiger " a covering party of Royal Marines was first landed, followed by the main invading force, represented by the 1st Battalion, The Welch Regiment. Horses, limbers and other impedimenta were conveyed to the beach. A squadron of aeroplanes from the coastal area section supported the troops. The operation was entirely successful.

FRANCE

Combined military and naval exercises took place on 8th-10th May, in the Sector Ile de Ré and Ile d'Oleron, under the direction of Vice-Admiral Le Vavasseur, Préfet Maritime at Brest. General Niessel, a member of the Superior Army Council, and General Mittelhauser, who commands the XVIIIth Army Corps, were present at the exercises.

The attack was carried out by the cruiser " Duguay Trouin," the flotilla leader " Léopard," and two destroyers.

The defence of the sector was in the hands of Rear-Admiral Le Do, each of the islands being under the command of a major of the Army Reserve. The troops were composed of detachments from various regiments, mainly infantry and artillery.

The measures of defence were such that a real enemy landing would probably have been prevented, all the vulnerable points of the two islands being formidably armed. The troops would undoubtedly have been able to sink the boats or overcome their occupants on landing.

The exercises were of great military and naval interest on account of the importance of these two islands as defence positions for the roads of La Pallice and Les Trousses.

NAVY NOTES

GREAT BRITAIN.

The Flag List.

During the past quarter, the following changes on the Flag List have taken place :—

Retirements and Promotions.

Admiral Sir James A. Fergusson, K.C.B., K.C.M.G., retired at his own request, 11th June. Consequent thereon, Vice-Admiral Hon. Sir H. G. Brand, K.C.B., K.C.M.G., K.C.V.O., was promoted to be Admiral, Rear-Admiral A. V. Campbell, C.B., D.S.O., M.V.O., to be Vice-Admiral, and Captain (Commodore 2nd Class) W. de M. Egerton, D.S.O., to be Rear-Admiral, from the same date.

Vice-Admiral Campbell retired 12th June ; consequent thereon, Rear-Admiral W. H. D. Boyle, C.B., was promoted to be Vice-Admiral, and Captain F. C. Fisher, A.D.C., to be Rear-Admiral, from the same date.

Rear-Admiral Fisher retired 13th June ; consequent thereon, Captain G. K. Chetwode, C.B., C.B.E., A.D.C., was promoted to be Rear-Admiral, from the same date.

H.R.H. Prince George.

Lieutenant H.R.H. Prince George, K.G., G.C.V.O., has been appointed to H.M.S. " Durban," 8th Cruiser Squadron, America and West Indies Station, and for duty as interpreter in French, to date 28th July. The " Durban " has just been transferred from the China Station, and *en route* to Bermuda has made a cruise off the Pacific coast of North America and up to Alaska and the Arctic Ocean. From 21st October, 1927, Prince George had been serving in the battleship " Nelson," flagship of the Atlantic Fleet.

Appointments.

Mediterranean Fleet.—Admiral Sir Roger Keyes, Bt., K.C.B., K.C.V.O., C.M.G., D.S.O., LL.D., D.C.L., relinquished command of the Mediterranean Fleet on 8th June, when he hauled down his flag in the " Queen Elizabeth " in Marseilles Roads. The Admiral took leave of the fleet at Malta on 5th June, when, according to custom, he was rowed off to his ship by six senior Captains, and as the flagship left harbour, a salute of seventeen guns was fired and the crews of the assembled ships cheered.

After hoisting his flag at Marseilles, the new Commander-in-Chief, Admiral Sir Frederick Field, K.C.B., K.C.M.G., proceeded to Toulon and Spezia to pay official calls to the French and Italian naval authorities.

China Station.—Vice-Admiral Arthur K. Waistell, C.B., formerly Commanding the First Cruiser Squadron, Mediterranean Fleet, is to be Commander-in-Chief, China Station, in succession to Vice-Admiral Sir Reginald Tyrwhitt, Bt., K.C.B., D.S.O., D.C.L., to date 13th November. He will assume command about 18th January, 1929.

AFRICA STATION—Rear-Admiral Rudolf M. Burmester, C.B., C.M.G., now Director of the Mobilization Department, Admiralty, is to be Commander-in-Chief, Africa Station, in succession to Vice-Admiral D. M. Anderson, C.B., C.M.G., M.V.O., to date 27th December, and will assume command about 11th February, 1929.

DIRECTOR OF MOBILIZATION.—Rear-Admiral Edward A. Astley-Rushton, C.B., C.M.G., who was promoted to flag rank in August, 1927, and was formerly Director of the R.N. Staff College, is to be Director of the Mobilization Department, Admiralty, in succession to Rear-Admiral Burmester, to date 18th December.

THIRD CRUISER SQUADRON.—Rear-Admiral Arthur J. Davies, C.B., late Chief of Staff, Atlantic Fleet, is to be Rear-Admiral Commanding the Third Cruiser Squadron, in succession to Rear-Admiral Lionel G. Preston, C.B., to date 27th December. He will assume command about 26th January, 1929.

RESERVE FLEET.—Vice-Admiral William H. D. Boyle, C.B., now Commanding the First Cruiser Squadron, Mediterranean Fleet is to be Vice-Admiral Commanding the Reserve Fleet in succession to Vice-Admiral Sir Hugh D. R. Watson, K.C.B., C.V.O., C.B.E., to date 4th December.

REAR-ADMIRAL AT MALTA.—Owing to the promotion and retirement of Vice-Admiral A. V. Campbell, on 11th-12th June, the appointment of Rear-Admiral F. H. Mitchell, C.B., D.S.O., to succeed him as Rear-Admiral, Malta, was amended to date 11th June, instead of 1st August.

FIRST CRUISER SQUADRON.—Rear-Admiral H. W. Parker, C.B., C.M.G., has been selected to be Rear-Admiral Commanding First Cruiser Squadron, in succession to Rear-Admiral W. H. D. Boyle, C.B., to date 10th September. He will assume command about 10th October.

ROYAL INDIAN MARINE.—The appointment of Rear-Admiral Humphrey T. Walwyn, C.B., D.S.O., to be Flag Officer Commanding and Director of the Royal Indian Marine is referred to under " Dominion Navies."

NEW ENGINEER-IN-CHIEF.—Engineer Vice-Admiral Sir Robert B. Dixon, K.C.B., D.Eng., relinquished the post of Engineer-in-Chief of the Fleet, which he had held for six years, on 1st June, and was succeeded by Engineer Rear-Admiral R. W. Skelton, C.B., C.B.E., D.S.O., formerly chief technical officer on the staff of the Commander-in-Chief at Portsmouth.

MEDICAL DIRECTOR-GENERAL.—A Fleet Order dated 13th July announced that the title of the Director-General of the Medical Department of the Navy has been altered to " Medical Director-General of the Navy." The older title had been in use since 1844.

PERSONNEL.

AWARDS OF PRIZES.—The Commander Egerton Memorial Prize for 1928 was awarded to Lieutenant S. S. C. Mitchell, R.N., of the " Excellent," gunnery school.

The Goodenough Memorial Prize for 1927 was awarded to Sub-Lieutenant H. W. Sims-Williams, R.N., of the destroyer " Voyager."

The Beaufort and Wharton Testimonials for 1927 were awarded to Lieutenant C. M. Jacob, R.N., of the battle-cruiser " Hood."

The Ronald Megaw Memorial Prize for 1927-28 was also awarded to Lieutenent C. M. Jacob, R.N., of the battle-cruiser " Hood."

Prizes of £10 have been awarded, on the result of the final examination held on completion of the advanced gunnery course at Greenwich, to Lieutenant J. C.

Clouston, R.N., of the battleship " Nelson," and Lieutenant H. Dalrymple-Smith, R.N., of the " Excellent," gunnery school.

(*See also under* FLEET AIR ARM.)

SERVICE AS SECRETARY.—It has been decided to abolish the symbol (8), signifying eight years as secretary to a Flag Officer, against the names of Accountant Officers in the seniority portion of the Navy List, but officers who have completed five years' service with the Status of Secretary to a Commander-in-Chief will be indicated by the symbol (S).

MATERIAL.

LAUNCH OF THE " YORK."—H.R.H. the Duchess of York performed the naming ceremony at the launch of the cruiser " York " at the Palmer's Shipbuilding Yard, Jarrow-on-Tyne, on 17th July. This vessel, authorised in the Navy Estimates of 1926, was laid down in May, 1927, and is the first of the new intermediate cruisers of the " B " class, with a displacement of 8,400 tons as compared with the 10,000 tons of the " A " class. The Palmer's Company is also building her machinery, which will be of 80,000 horse-power, similar to that of the " Kent " and " London " classes. The ship will carry six 8-in. guns in twin turrets, as compared with eight 8-in. guns in the earlier cruisers.

A second ship of the class, authorised in 1927, is to be built at Devonport Dockyard and named the " Exeter." Her first keel-plate was laid by Mrs. Bentinck, wife of the Commander-in-Chief, on 1st August. It is the intention to give to this class the names of cathedral cities, to distinguish them from the larger vessels which take the names of counties.

LAUNCH OF THE " SHROPSHIRE."—The launch of H.M.S. " Shropshire," the first ship to bear this name in the Royal Navy, took place from the yard of Messrs. Beardmore & Co., Dalmuir, on the afternoon of 5th July, when the naming ceremony was performed by the Countess of Powis, wife of the Lord Lieutenant of the County. The " Shropshire " was the fourth and last ship of the 1925 programme to take the water, the others being the " London," at Portsmouth; " Devonshire," at Devonport, and " Sussex," at Hawthorn Leslie's yard on the Tyne. They are of the same standard displacement (10,000 tons), horse-power (80,000), and armament (eight 8-in.; four 4-in. A.A.; twenty smaller guns; and eight torpedo tubes), as the five ships of the " Kent " class of the 1924 programme, but the designed speed will be 32¼ instead of 31¼ knots.

SUBMARINE LAUNCHES.—The new submarine " Osiris " was launched at the Vickers yard, Barrow-in-Furness, on 19th May, Lady Dixon, wife of the Engineer-in-Chief of the Fleet, performing the naming ceremony. This was the first of the five contract-built submarines of the 1926 programme. Another, the " Oswald," was launched at Barrow a month later, on 19th June, when the vessel was released by Mrs. Layton, wife of Captain Geoffrey Layton, D.S.O., Deputy Director of the Operations Division, who was formerly Chief Staff Officer to the Rear-Admiral (S) and had command of submarines during the war. The third of the boats ordered from the Vickers works, H.M.S. " Otus," was due to be launched in August, and will be the 149th submarine launched from the Barrow yard. The dockyard vessel of the programme, H.M.S. " Odin," was launched on 5th May at Chatham, the naming ceremony being performed by Mrs. Stirling, wife of the Admiral-Superintendent.

LAUNCH OF THE "MEDWAY."—On 19th July, the submarine depot-ship "Medway" was launched at the Barrow works of Messrs. Vickers-Armstrongs, Ltd., the naming ceremony being performed by Lady Chatfield, wife of Vice-Admiral Sir Ernle Chatfield, Third Sea Lord and Controller. The "Medway" will have internal combustion engines of the two-stroke double-acting type, to the designs of the M.A.N. Company (Maschinenfabrik-Augsburg-Nürnberg) for which the Vickers-Armstrongs firm have the patent rights in the British Empire and Colonies. The "Medway" was authorised in the Estimates of 1926, and is due for completion in 1929.

DESTROYER CONTRACTS.—On 1st June, the Admiralty announced that the contract for the hull of the new destroyer "Acheron" had been placed with Messrs. Thornycroft, of Woolston, and that the machinery for the ship would be built by Messrs. Parsons, of Wallsend-on-Tyne. This was the last of the destroyers of the programme to be ordered; contracts for the rest were recorded in the May issue of the JOURNAL (page 386). The name of the new destroyer building by the Scott's Shipbuilding Company at Greenock should be "Anthony" and not "Antony."

THE SINGAPORE FLOATING DOCK.—The new floating dock for use at the Singapore base left the works of Messrs. Swan Hunter and Wigham Richardson on the Tyne in two portions during June, and it was calculated that the sections would reach Singapore on 31st October and 11th November respectively. The dock is the largest floating structure to pass through the Suez Canal.

EXERCISES AND CRUISES.

ATLANTIC FLEET CRUISE.—The Atlantic Fleet under Admiral the Hon. Sir Hubert Brand was at Invergordon during May and at Scapa from 4th to 9th June, when its squadrons and flotillas separated for independent cruises. The Second Cruiser Squadron and Sixth Flotilla visited Scandinavian and Baltic waters. From 4th to 11th July the Fleet was in Torbay for the annual sailing regatta, where it was visited during the week-end of the 7th to 9th by Mr. Bridgeman, First Lord. From 11th to 25th July, the fleet visited several coast resorts, including Seaton, Bournemouth, Folkestone, Deal, Swanage, Sandown Bay, Eastbourne, Hastings, Southend and Clacton.

MEDITERRANEAN FLEET CRUISE.—After assuming command of the Mediterranean Fleet, Admiral Sir Frederick Field left Malta with the squadrons and flotillas on 27th June for a two months' cruise on the eastern part of the Station. Navarino, Skiathos, Crete and Argostoli were among the places in the programme.

VISITS TO SOUTH AMERICA.—The White Ensign has been displayed rather more than usual this year in South American waters. The new destroyers "Amazon" and "Ambuscade" carried out, from April to August, a cruise down the east and up the west coast, returning through the Panama Canal. The cruiser "Cornwall," on her way out to China, was despatched *via* the Falklands and Straits of Magellan, and to call at Honolulu in August to represent Great Britain at the sesquicentennial celebrations of the discovery of the Sandwich Islands by Captain Cook. The "Capetown" and "Colombo" have also been cruising in South America as part of their normal service in the Eighth Cruiser Squadron, America and West Indies Station.

NAVAL EVENTS.

H.M. THE KING'S VISIT TO PORTSMOUTH.—H.M. King George visited Portsmouth Dockyard on Tuesday, 17th July, and inspected the new Commonwealth cruisers

" Australia " and " Canberra," the new battleship " Nelson," and the " Victory." His Majesty unveiled a tablet commemorating the completion of the work of restoring Nelson's old flagship to her condition at the time of Trafalgar. The details have been supervised by the Society for Nautical Research.

VISIT OF H.R.H. THE PRINCE OF WALES.—The Prince of Wales visited Portsmouth on 27th June, and after attending the anniversary celebrations of the 1st Battalion Royal Scots Fusiliers at the Victoria Barracks, Southsea, in the morning, he inspected the Dockyard. Subsequently he embarked in a pinnace for Calshot, where he visited the Air Station, and flew in a seaplane over Southampton Water, returning by pinnace to Portsmouth. Remaining overnight at Admiralty House, His Royal Highness on the 28th went on board the " Australia " and the " Victory," and also inspected the Royal Naval Barracks, where he saw the men at divisions on the parade ground and also under instruction in the gymnasium.

KING'S COLOUR AT CARDIFF.—The unveiling ceremony of the Welsh National War Memorial at Cardiff on 12th June, by the Prince of Wales, was made the occasion for the first parade of the King's Colour of the Royal Naval Barracks, Devonport. The Navy was represented at the ceremony by a detachment of three officers and 100 men from H.M.S. " Carysfort," parent ship of the Devonport Reserve, and the Colour was paraded by the naval Guard of Honour, Lieutenant T. A. C. Pakenham, R.N., of Devonport Gunnery School, being the Colour Officer.

MACPHERSON COLLECTION.—At the annual general meeting of the Society for Nautical Research, held at the Royal United Service Institution on 20th June, Admiral Sir George Hope announced that by the generosity of Sir James Caird, the Macpherson Collection of maritime prints and paintings had been saved for the nation and would be placed in the National Maritime Museum at the Queen's House, Greenwich.

GROUNDING OF H.M.S. DAUNTLESS."

H.M.S. " Dauntless," Captain K. D. W. Macpherson, grounded on the Thrum Cap Shoal off Halifax, Nova Scotia, during foggy weather at 2 p.m. on 2nd July. The shoal is to starboard of the channel going in, and about 5½ miles from Halifax. Her two boiler rooms were pierced and lay open to the sea for their whole length on the port side, and the majority of her compartments were not watertight below the upper deck. The working of the ship in the swell after grounding crashed in the starboard side of the boiler-rooms for a length of about five feet. Captain Macpherson ordered the ship to be abandoned about four hours after she struck, and advised vessels near to keep clear as there was a danger of her breaking in two. The Canadian minesweepers " Festubert " and " Ypres " accommodated some of the ratings and effects. Salvage operations were begun at once, and Admiral Sir Walter Cowan arrived on the 4th in the " Despatch " to take charge of them. All guns, stores, torpedoes and movable fittings were taken out, and the weather being moderately favourable the work proceeded without delay. The American salvage steamer " I. J. Merritt," and four pontoons of a total lift of 300 tons, were engaged, and proceeded to the wreck to render help. The offer of the U.S. Navy authorities to lend two pontoons from Boston Navy Yard was accepted with gratitude. On the afternoon of 11th July, by means of sealing certain compartments with compressed air after the ship had been lightened, the " Dauntless " was released from the rocks, and towed into Halifax to be docked. The ship's company had already been sent home by steamer.

FLEET AIR ARM.

NEW AIRCRAFT-CARRIER.—H.M.S. " Courageous," which was commissioned at Devonport on 21st February, 1928, with a full Portsmouth crew for service as an aircraft-carrier, completed her trials satisfactorily, and on 2nd June left Portsmouth to join the Mediterranean Fleet as a second carrier with the " Eagle." Her completion brought up the total of large carriers in commission with the fleet to five.

HENRY LEIGH CARSLAKE PRIZE.—The subject of the essay for the award in 1929 of the Henry Leigh Carslake Prize for Naval Observers is to be " The employment of aircrafts as an adjunct to cruisers working on the trade routes." Essays must reach the Admiralty by 1st February, 1929. Particulars regarding the prize are contained in page 127 of the Appendix to the Navy List, April, 1928.

The Prize for 1928 has been awarded to Lieutenant-Commander Lachlan D. Mackintosh, D.S.C., R.N., of H.M.S. " Courageous."

ROYAL MARINES.

RANK OF BRIGADIER.—H.M. the King has been graciously pleased to approve the grant, with effect from 1st June, 1928, of the temporary rank of Brigadier to Colonels Commandant, Royal Marines, while in command of Royal Marine Divisions and the Royal Marine Depot. The officers' emoluments and relative rank will remain unchanged. The first Colonels Commandant to be granted the rank are Percy Molloy, Chatham ; A. G. Little, C.M.G., Portsmouth ; C. L. Mayhew, Deal Depot ; and G. L. Raikes, C.B., D.S.C., Plymouth.

ROYAL NAVAL RESERVE.

CAPTAINS' WAR COURSE.—Two Captains of the R.N.R., Captain C. P. Cooper, O.B.E., R.D., and Captain F. E. French, R.D., took the War Course for Senior Officers of the Royal Navy held at the War College, Greenwich, from 10th March to 20th July.

CONDITIONS OF SERVICE.—A new edition of the Regulations for the Royal Naval Reserve (Men), revised to 2nd March, 1928, has been issued by H.M. Stationery Office, price 2/-.

ROYAL NAVAL VOLUNTEER RESERVE.

ULSTER DIVISION.—The Division provided a Band and a Battery of four field guns on the occasion of the laying of the foundation stone of the Houses of Parliament, Northern Ireland, at Stormont, on Saturday, 19th May, 1928.

A Guard of Honour was provided by the Division on the occasion of the visit to H.M.S. " Caroline " of His Grace The Duke of Abercorn, Governor of Northern Ireland on the 16th May. The ship was inspected by His Grace during his visit.

CLYDE DIVISION.—The Division provided a Guard of Honour on the occasion of Lieutenant H.R.H. Prince George, K.G., K.C.V.O., R.N., receiving the Freedom of the City of Glasgow at St. Andrew's Hall on the 27th April, 1928.

SUSSEX DIVISION.—The Division provided a Royal Guard of Honour on the occasion of the visit of T.R.H. The Duke and Duchess of York to Brighton on the 30th May, 1928.

BRISTOL DIVISION.—The Division provided a Guard of Honour to receive H.R.H. The Prince of Wales at Temple Meads Station on the 23rd May, 1928.

ASSISTANCE TO VOLUNTEER CADET CORPS.—It has been decided that as from 1st April, 1928, Voluntary Cadet Corps attached to R.N. Shore Establishments in the United Kingdom, and Boys' Corps affiliated to R.N.V.R. Divisions, shall be eligible for assistance from naval funds to the same extent as recognzied units of Sea Cadet Corps. A grant of 3s. 6d. per annum in respect of each efficient cadet will accordingly be paid in future to the Commanding Officer of each Establishment or Division to which such a corps is attached. The grant is to be utilised to meet the necessary expenses connected with the formation, organization and administration of the Corps, and for increasing their efficiency, but not for social, religious or other purposes.

DOMINION NAVIES

AUSTRALIA.

NEW CRUISERS.—H.M.A.S. "Australia" was commissioned at Clydebank, where she was built, on 24th April, for duty as flagship of Rear-Admiral George F. Hyde, C.V.O., C.B.E., Commanding the Australian Squadron, and arrived at Portsmouth on 28th April, the transfer of the flag and ship's company from the "Melbourne" taking place on 2nd May.

During the month of June, officers and men from the "Australia" and "Canberra" were entertained by the Admiralty, and taken to see the Trooping of the Colour, the Royal Tournament, the Derby, and the Aldershot Tattoo. Both cruisers were inspected at Portsmouth on 17th July by H.M. King George. His Majesty was received in the "Australia" by Rear-Admiral Hyde, and Sir Granville Ryrie, High Commissioner for Australia, was also present. In the "Canberra," the King was received by Captain G. L. Massey, R.N., commanding the cruiser.

The "Australia" left Portsmouth on 21st July to spend a week at Portland prior to leaving for Australia, *via* Canada, the Panama Canal and New Zealand. She finally left Spithead at midnight on 2nd-3rd August.

CANADA.

NEW DESTROYERS.—The destroyers lent to the Canadian Government from the Royal Navy, the "Torbay" and "Toreador," now renamed the "Champlain" and "Vancouver," left Portsmouth on 17th March, and proceeded in company to Las Palmas, St. Vincent (Cape Verde Isles), Trinidad and Jamaica, anchoring off Kingston from 21st April to 2nd May. The "Champlain" then visited Bermuda and reached Halifax on 12th May; while the "Vancouver" proceeded through the Panama Canal to Manzanillo, San Pedro and Esquimalt, arriving at the last-named port on 30th May. The "Patriot" and "Patrician" have been placed on the disposal list at Halifax and Esquimalt respectively.

ROYAL INDIAN MARINE.

NEW FLAG OFFICER COMMANDING.—It was announced on 7th June that Rear-Admiral Humphrey T. Walwyn, C.B., D.S.O., had been appointed Flag

Officer Commanding and Director of the Royal Indian Marine, to date 5th October. He will assume command about 16th November. Rear-Admiral Walwyn, who remains on the active list of the Royal Navy, was promoted to flag rank on 22nd Feburary, 1928.

NEW REGULATIONS.—The Bill for the creation of a Royal Indian Navy passed the British Parliament in the spring of 1927, but in February, 1928, the Legislative Assembly in India refused to pass it. An official communique issued on 7th June, 1928, at Simla shows that the Indian Government has decided to complete the reconstruction of the Royal Indian Marine in accordance with the recommendations of the Departmental Committee of 1925, but the force will not have the right to be called the Royal Indian Navy. It will, however, become a combatant force, and will assume the functions, and serve under the conditions regarding pay and pensions, which were originally intended for the Royal Indian Navy. Indians will be eligible for commissioned and warrant ranks, one commissioned vacancy in three, both in executive and engineer branches, being reserved for them.

FOREIGN NAVIES

ARGENTINA.

NEW SLOOPS.—The sloops "San Juan" and "San Luis," designed for the Hydrographic Service, have recently been completed for the Argentine Navy by Messrs. Hawthorn Leslie & Co., Hebburn-on-Tyne. Their machinery consists of a four-cycle, single-acting Hawthorn-Werkspoor Diesel engine, giving about 950 I.H.P. The vessels are rigged as three-masted schooners, with raked stem and counter stern.

NAVAL AIRCRAFT ORDERS.—A substantial order was placed early in June for aircraft of the Fairey III.F type with the Fairey Aviation Company, of Hayes, Middlesex, for service with the Argentine Navy. These particular machines can be adapted for a variety of purposes, and used either as landplanes or seaplanes.

Later in June, it was announced that the Argentine Government had also ordered six large flying boats of the "Southampton" type from the Supermarine Aviation Works, Ltd., of Woolston, Hants.

CHILE.

TRANSPORT DISASTER.—The Chilean transport "Angamos" foundered off the coast of Chile on the night of 6th July, with a loss of 201. Among the messages of condolence sent to the Chilean Government was one to the Minister of Marine from the First Lord of the Admiralty. The lost ship was built on the Tyne by Messrs. Swan, Hunter in 1890 as the "Città di Venezia," and subsequently reconstructed in Chile. Her displacement was 5,975 tons.

DESTROYER LAUNCHED.—The destroyer "Hyatt," the fourth of the six building by Messrs. Thornycroft & Co., Ltd., at Woolston, was launched on 21st July, the naming ceremony being performed by Madame Margarita de Cubillos, the wife of Rear-Admiral Desiderio Cubillos, Engineer-in-Chief of the Chilean Naval Commission. The vessel is named after the chief engineer of the "Esmeralda," who went down with his ship when she was sunk by the "Huascar" at the Battle of Iquique. All of the new destroyers are named after officers who served with distinction in that engagement.

TRAINING SHIP CRUISE.—The training ship "General Baquedano" visited Dartmouth and Portsmouth during the latter half of July. Officers and cadets were entertained, and also visited London.

DENMARK.

TRAINING SHIP VISIT.—In the course of one of her instructional cruises, the training ship "Hejmdal" visited Oban from 23rd to 25th June.

FRANCE.

REVIEW AT LE HAVRE.—A review of the French fleet by President Doumergue was held at Le Havre on 3rd July. There were present a total of seventy-nine ships, including four battleships, the "Provence," "Lorraine," "Bretagne," and "Jean Bart"; the aircraft-carrier "Béarn"; the new cruisers "Lamotte-Picquet," "Duguay-Trouin," and "Tourville"; the ex-German cruisers "Mulhouse" and "Strasbourg"; thirty-two destroyers, and three others escorting the President; twenty-four submarines, two minesweepers, and eight despatch boats.

M. Doumergue, on arrival at the port, went on board the new 10,000-ton cruiser "Duquesne," and after luncheon he inspected the training cruiser 'Jeanne d'Arc." The review of the fleet was conducted from the new flotilla-leader "Jaguar," one of the six new leaders completed in 1926-27.

In a speech at the luncheon the President said that France is determined to hold her naval rank, but not in any ambitious spirit. She has an immense coastline, and her colonies are spread in the four corners of the earth. The complete freedom of the seas is indispensable for her to maintain her overseas communications, and protect her 50,000,000 colonial citizens.

LAUNCH OF THE "COLBERT."—The cruiser "Colbert," which was launched at Brest on 20th April, is the fourth ship of the 10,000-ton class, the others being the "Duquesne," "Tourville" and "Suffren." The "Colbert" was brought to the launching stage in ten months.

GERMANY.

LAUNCH OF THE "KÖLN."—On 23rd May, the fourth of the German cruisers of the replacement programme was launched at Wilhelmshaven, and named the "Köln." The first cruiser, the "Emden," was completed in 1925, and has since made a world cruise. The "Emden" is of 6,000 tons (the limit imposed by the Versailles Treaty), 46,000 horse-power, 29 knots designed speed, and carries an armament of eight 5.9-in. and three 3.4-in. guns, with four torpedo tubes. The three later cruisers, built on a new plan for saving weight wherever possible, including the adoption of welding instead of rivetting, will, on the same displacement, have engines of 65,000 horse-power, giving a designed speed of 32 knots, and carrying nine 5.9-in. guns in triple mountings.

TARGET SHIP.—The old battleship 'Zahringen" has been converted into a target ship to replace the "Baden." The ship has been filled with several thousand tons of cork and the upperworks have been altered to give her the appearance of a "Deutschland" class battleship.

MINELAYING MISHAP.—Six ratings were killed and two officers and several ratings wounded in an explosion during minelaying exercises in the Baltic on 7th June. A minelaying detachment with Kiel as its base had been carrying out exercises for some days, and on the 7th two small launches, known as "C.12" and "C.8," containing about twenty men under instruction, were towed out, accompanied by a torpedo boat. In the former launch, a charge is said to have exploded, killing all the occupants, and wounding several men in "C.8."

GREECE.

THE "SALAMIS" CASE.—On 13th June, the Greek Government received the decision of the Norwegian arbitrator, Admiral Scott-Hansen, in the dispute about the battle-cruiser "Salamis." The Admiral was appointed to define whether the "Salamis," as ordered in 1914, fulfils the requirements of present-day naval warfare. According to *The Times* Correspondent at Athens, the Admiral states that if asked to decide whether the vessel as completed according to the original plans and specifications complies with these requirements he would unhesitatingly reply in the negative; but if asked to examine the equity of the question he could not suggest an ideal solution. He recognises that the "Salamis" is deficient in certain respects, and enumerates ten technical shortcomings which should be rectified by the Vulkan Company at its expense without additional cost to Greece.

ITALY.

NEW CRUISERS.—The new 10,000-ton cruisers, "Trento" and "Trieste," were commissioned for trials on the 1st and 15th April, respectively.

JAPAN.

WITHDRAWAL FROM CHINA.—On 21st June, it was announced that, in view of the improving situation in the Yangtse Valley and in South China generally, the Japanese Government had ordered the withdrawal of the four destroyer flotillas and other additional war vessels, to the total of twenty-seven, which were sent to China in May. An official statement gave the Chinese credit for the fact that during forty days no untoward incidents worth mentioning had occurred; but it was added that the ships would be held in readiness.

BRITISH FLYING BOAT ORDER.—An order has been placed for an all-metal flying boat of the "Southampton" type to be built by the Supermarine Aviation Works, Ltd., for service with the Japanese Navy. Flying boats of this type, fitted with Napier-Lion engines, compose the Far East Flight which has recently made the journey from Cattewater to Australia.

VISIT TO AUSTRALIA.—By a coincidence, the arrival of the Far East Flight of the R.A.F. in Australia coincided with the visit of the Japanese training division "Yakumo" and "Idzumo" to Commonwealth ports. At a reception given by the Commonwealth Club at Adelaide to the Squadron and the Flight, Admiral Kobayashi said that the Japanese were trying to be good pupils of Great Britain and worthy of the Navy to which they owed so much for its kindness and assistance. Group Captain Cave-Browne-Cave said that when the British aviation instructors returned from Japan, they loudly praised her enthusiasm for air matters. The Squadron and the Flight both left Adelaide for Melbourne on 29th June. The former was afterwards due to visit Hobart, Sydney, Wellington, Auckland and Suva.

NETHERLANDS.

NEW DESTROYERS.—The "Piet Hein," one of the six destroyers designed by Messrs. Yarrow & Co., which are being built in Holland yards under their supervision, achieved a speed of 36.1 knots on her trials, although only designed for 34 knots with a full load. This group is intended for service in the Dutch East Indies.

SWEDEN.

NEW COAST DEFENCE SHIP.—The following is a comparison between the "Sverige" Class and the proposed new Coast Defence Ships :—

	"Sverige" Class.	*New Type.*
Displacement	7,400 tons	7,520 tons
Length	393 feet	426 feet
Beam	61 feet	61 feet
Draught	20 ft. 5 in.	20 ft. 6 in.
Speed	22–23 kts.	24 kts.
H.P.	24,500	28,500
Armament	Four 11 in.	Four 11 in.
	Eight 6 in.	Six 6 in.
	Six 3 in.	Four 3 in.
	Two 18 in. Torpedo Tubes.	No Torpedo Tubes
Number of Armoured Decks	One	Two

TURKEY.

NEW SUBMARINES.—Two 500-ton submarines ordered from the Fijenoord Company, of Rotterdam, in 1926, arrived at Constantinople on 9th June. These were the first new vessels added to the Turkish Navy since 1914.

UNITED STATES.

THE FLEET IN 1928-29.—The following ships of the U.S. Navy will be in and out of commission during 1928-29 :—

	In Commission.	*Out of Commission.*
Battleships—		
Full commission	16	—
Reduced commission (being modernized)	2	—
Cruisers	16	16
Aircraft Carriers	3	—
Aircraft Tenders	1	—
Minelayers	2	2
Destroyers	106	164
Light Minelayers	6	8
Submarines	80	43

The "Oklahoma" and "Nevada" are being modernized and the elevation of their turret guns is being increased. All battleships except the six older ships are to have their gun elevations increased in due course.

Three battleships have been equipped with 5-in. A.A. guns already and a fourth will be so fitted in 1928-29; one vessel will follow each year until all the 14-in. battleships are complete.

CRUISER CONSTRUCTION BILL.—Congress adjourned on 29th May without having sanctioned the Bill for the construction of fifteen cruisers and one aircraft-carrier, which is accordingly postponed until December. The Bill, which provided for the ships to be completed in five years, passed the House of Representatives, and was favourably reported on by the Senate Naval Committee, but on 26th May the Senate rejected it by 44 votes to 22, in what was evidently a "snap" division. Opponents of the Bill had been able to block its consideration until the last moment. A clause inserted into the Deficiency Appropriation Bill provides £40,000 for beginning the building of four destroyer-leaders of about 1,800 tons, and three fleet submarines. Authorization for building these vessels was given in the great naval programme of 1916 and needed no renewal.

"LEXINGTON'S" TRIALS.—On 1st May, it was reported that on her trials, the aircraft-carrier "Lexington" failed to come within eleven knots of the designed 33 knots speed. Unofficially, it was stated that the ship's engines developed trouble, and that until this has been corrected the Navy Department would not accept the vessel from the builders.

Between 9th and 12th June, however, the ship is claimed to have achieved a world's record, when she steamed 2,228 miles from San Diego to Honolulu at an average speed of 30.7 knots. A further record is claimed for her, in covering a distance of 770 miles in 24 hours.

Owing to defects in her turbines, the "Lexington" only developed 148,000, instead of 180,000 h.p. A later report states that the ship attained a speed of 33.04 knots on a measured mile run.

"SARATOGA'S" TRIALS.—The aircraft-carrier "Saratoga" carried out her steam trials off San Pedro, California, during the latter part of June, and is reported to have attained a speed of 33.42 knots on the measured mile, which is claimed as a world's record for a ship of her class and tonnage (33,000). It is stated that this ship also has certain turbine blading removed on account of hair-line cracks.

ARMY NOTES

HOME.

APPOINTMENTS AND PROMOTIONS.—The following are the principal appointments and promotions announced during the past quarter:—H.M. the King has been pleased to promote General H.M. Alfonso XIII, King of Spain, K.G., G.C.V.O., Colonel-in-Chief, 16th/5th Lancers, to be Field Marshal in the Army; H.M. the King has been pleased to approve of the appointment of Colonel (temporary Colonel Commandant) C. H. Foulkes, C.B., C.M.G., D.S.O., and Colonel W. J. Dugan, C.M.G., D.S.O., as Aides-de-Camp to The King, in succession to Colonel W. H. Beach, C.B., C.M.G., D.S.O., and Colonel E. Evans, C.B., C.M.G., D.S.O., promoted to the rank of Major-General; General Sir J. F. Noel Birch, G.B.E., K.C.B., K.C.M.G., to be Colonel Commandant, Royal Horse Artillery; General Sir P. W. Chetwode, Bt., K.C.B., K.C.M.G., D.S.O., Aide-de-Camp General, has been appointed Chief of the General Staff in India, in succession to Lieut.-General Sir A. Skeen, K.C.B., K.C.I.E., C.M.G., Indian Army, Aide-de-Camp General; Major-General B. F. Burnett Hitchcock, C.B., D.S.O., to be General Officer Commanding, Deccan District, India, in succession to Lieut.-General Hon. J. F. Gathorne-Hardy, C.B., C.M.G., D.S.O.; Major-General Sir W. E. Ironside, K.C.B., C.M.G., D.S.O., has been appointed General Officer Commanding, Meerut District, India, in succession to Major-General Sir G. McK. Franks, K.C.B.; Major-General T. A. Cubitt, C.B., C.M.G., D.S.O., has been appointed General Officer Commanding, 2nd Division, Aldershot, in succession to Major-General Ironside; Major-General W. H. Bartholomew, C.B., C.M.G., D.S.O., has been appointed Commandant of the Imperial Defence College in succession to Vice-Admiral Sir H. W. Richmond, K.C.B. (the appointment will take effect in January, 1929); Major-General H. W. Higginson, C.B., D.S.O., has been appointed General Officer Commanding, 55th West Lancashire Division, Territorial Army.

The promotion of Colonel (temporary Brigadier) S. C. Peck, C.B., D.S.O., to the rank of Major-General, has been approved, and will be carried out shortly.

THE LIFE GUARDS.—The King has approved of The Life Guards (1st and 2nd) being in future designated The Life Guards.

RANK OF BRIGADIER.—The rank of "Brigadier" has been substituted for that of Colonel-Commandant and Colonel on the Staff as from 1st June, 1928.

Officers holding the new rank will have precedence of, and command over, all other colonels. Among themselves they will take precedence according to their permanent rank. They will wear the same dress and rank badges as prescribed for colonels-commandant and colonels on the staff.

DISBANDMENT.—H.M. The King has approved, with regret, the dibandmenty of The West African Regiment.

BATTALION INTELLIGENCE SECTIONS.—The training of the intelligence sections of infantry battalions is to be modified. The personnel of the battalion intelligence

sections are defined as " highly trained soldiers who are allotted special tasks to gain definite information, both as regards the enemy and our own troops, and thus form the first link in the chain of battle intelligence." They will not as a rule be used as patrols ahead of their own unit or given such missions as the occupation of tactical posts.

Special training will be given to these intelligence sections in the use of field glasses and prismatic compass; map reading; visual training; judging distance; message writing; camouflage; recognition of aircraft; quick decision and night work. The N.C.O. of the section will, in addition, be specially trained in verifying reports and selecting observation posts. The officer in charge of the section will be trained (i) to deal with all intelligence reports received at battalion headquarters from forward units and his own section, and to ensure the rapid transmission of intelligence to brigade headquarters; (ii) to arrange for constant observation and the supply of early and accurate information to his battalion commander; and (iii) to organise his section so that at least one pair of men will always be ready for special unexpected tasks.

SMALL ARMS TRAINING.—The best shooting squadron or company in a regiment or battalion of the Regular Army will be that with the lowest percentage of 3rd class shots with the rifle and Lewis Gun amongst trained soldiers, except that eight marksmen or sixteen 1st class shots will neutralise one 3rd class shot. In cases where there are a number of marksmen below eight, each of such marksmen may be counted as the equivalent of two 1st class shots for the purposes of neutralization. The same system will be applicable to the Territorial Army, except that ten 1st class shots will neutralise one 3rd class shot. In the event of a tie under this system, the best shooting company will be that with the lowest percentage of 2nd class shots. The regimental or battalion figure of merit will be the total percentage of 3rd class shots—including 3rd class light automatic gunners—in the unit.

For the best combined rifle and light automatic shots in the Regular Army badges will be issued annually as follows: best shot amongst N.C.O's and men in each squadron or company, *star and crossed rifles;* best shot amongst sergeants and lance-sergeants in a regiment or battalion, *crown and crossed rifles in wreath;* best shot amongst corporals and privates in a regiment or battalion, *star and crossed rifles in wreath.*

In the Territorial Army, the following special badges will be worn by warrant officers and N.C.O's and trained soldiers who qualify in the manner specified in the annual classification practices: 1st class rifle shots—*single rifle;* 1st class Light Automatic gunners—*" L.G."* (without wreath); best rifle shot in each squadron or company—*single rifle and star;* best rifle shot in regiment or battalion—*single rifle and crown in wreath;* best light automatic shot in each squadron or company—*" L.G." and star;* and best light automatic shot in regiment or battalion—*" L.G." and crown.*

ALLOWANCES FOR DECEASED OFFICERS' CHILDREN.—An amendment of the rules governing the grant of compassionate and education allowances concurrently for the children of deceased officers of the Army provides that compassionate allowances may be granted, or continued at the discretion of the Army Council, to sons after the age of 18 years and to daughters after the age of 21 if they are apprentices receiving not more than nominal wages, or are being educated at a secondary school, technical school, or university.

TECHNICAL CAREERS FOR BOYS IN THE ARMY. — The training of boys for skilled work in the Regular Army is to be continued at Chepstow, Catterick, Gosport, Woolwich, and other centres. In the autumn there will be vacancies for approximately 200 new apprentices. Candidates, who must be 14 and under 15 years and four months on 1st September next, will be selected by means of a competitive examination. Those who pass the required test will be given the opportunity of spending about three years in learning one or other of a variety of trades, comprising those of armourer, blacksmith, carpenter and joiner, electrician and fitter. During training the boys will be maintained free of cost to their parents or guardians and will, in addition, be paid 7/- a week.

SUPPLEMENTARY RESERVE : OFFICERS' TRAINING.—In order to suit the various circumstances of officers of the Supplementary Reserve Category "B," the regulations for training have been made more elastic. Officers may now spread their preliminary training over a maximum period of four years, provided that not less than one month's training is carried out in any one year and the whole training is carried out in consecutive years. To suit candidates who may not be able to carry out the normal three weeks' annual training laid down for certain arms, the annual training may be reduced to one week a year or two weeks in alternate years, provided that the prescribed periods of preliminary training are extended by three months.

DOMINION FORCES.

REGIMENTAL ALLIANCES. — H.M. The King has approved of the following alliances :—

Non-Permanent Active Militia of Canada.—The 78th Field Battery, Canadian Artillery, to the 78th Field Battery, Royal Artillery.

Australian Military Forces.—The 15th Battalion to The East Yorkshire Regiment ; the 26th Battalion to The Cameronians (Scottish Rifles).

PROPOSED MEMORIAL TO THE LATE LIEUT.-GENERAL SIR RONALD CHARLES MAXWELL, K.C.B., K.C.M.G.

At a recent meeting of friends and comrades of the late Lieut.-General Sir Ronald Maxwell it was decided to erect a memorial to mark the admiration and respect for his character which was felt by all who knew him, and to commemorate the eminent services which he rendered, particularly when Quartermaster-General to the Forces in France during the Great War. It is thought that such a scheme may appeal to many who were associated with Sir Ronald Maxwell during his career, and that these may welcome the opportunity of contributing to the Memorial.

The General Committee have decided, with the permission of the Dean and Chapter, to place the Memorial in Rochester Cathedral, close to where so much of Maxwell's Home Service was spent and where he was married. It is hoped to raise sufficient funds for a stained-glass window and tablet.

Donations will be gladly received and acknowledged, but no statement of individual contributions will be published.

Lloyds Bank Limited (Cox's and King's Branch), No. 6, Pall Mall, S.W.1, have kindly consented to open an account called "Maxwell Memorial Fund," into which contributions should be paid direct.

B. BLOOD, *General.*
Chairman of General Committee.

H. M. LAWSON, *Lieut.-General,*
Chairman of Executive Committee.

FOREIGN

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BALKAN STATES.

BULGARIA.—At the end of May, 1927, when the Organ of Liquidation was finally dissolved, the total strength of the army was 29,792 officers and men, and 2,713 civilians. The latter are being gradually dismissed in order to bring the strength down to the 30,000 allotted by the Treaty of Neuilly. Of this strength 3,000 are frontier guards, and 6,800 gendarmerie, leaving approximately 20,000 for the army.

The equipment is almost entirely German; according to the Organ of Liquidation it is in very good order. There are probably sufficient arms and equipment to put into the field 100,000 men, which is about all that Bulgaria could mobilize on the outbreak of war. However, there are many indications pointing to the fact that Bulgaria is introducing into the country at regular intervals further munitions of all kind. If this continues she may, in the future, be in a position to equip her normal mobilized strength, which can be taken to be in the neighbourhood of 300,000 men.

The German training manuals have been taken almost verbatim for the use of the army. Most of the senior officers have had training in Germany and generally speaking the army is imbued with German ideas. Since the war nothing bigger than regimental exercises have taken place, and no foreign officers have been allowed to attend these.

GREECE.—The French Military Mission continued its work throughout 1927 and as a result there has been a distinct improvement in the standard of proficiency of the Greek regimental officer. The Greek Government has signed a new contract with the mission prolonging its engagement until 1st October, 1929. Under the new contract the number of French officers is to be reduced from sixteen to ten; other conditions remaining unchanged. General Girard, the head of the mission, is due to return to France next June and his successor, General Brallion, has arrived in the country.

No manœuvres took place in 1927, nor, for financial reasons, are any likely to be held for some time. The usual garrison exercises were carried out and staff rides were organized by the French Military Mission.

Official decrees have been published abolishing the Vth Corps Headquarters, the 7th Division and certain small units. The army thus returns to a four corps organization similar to that which obtained before General Pangalos created the Vth Corps. The latter has had little more than a theoretical, paper, existence, and the same applies to other units which have now been abolished. The net result, therefore, is that the Greek army remains at much the same strength as before. According to the official returns the present peace strength of the army is 79,000, but it is extremely doubtful whether this is a true figure; any estimate must be largely a matter of guesswork and it is considered that for practical purposes the peace strength may be taken as between 60,000 and 70,000.

YUGO-SLAVIA.—The Skupstina had passed the Defence Estimates for 1928-29 which amount to 2,428½ million dinars (£9,000,000 approximately). This represents an increase of 79 million dinars over the estimates for the previous year. In introducing his estimates before the Financial Committee of the Chamber, General

Hadjié, the Minister for War, pointed out that the estimates did not indicate a marked increase above the actual expenditure of 1927-28, taking into account the large supplementary estimates (51 million dinars) which had been rendered necessary in that year.

The official figures are liable to a certain degree of subsequent manipulation, and they do not therefore furnish a precise guide to the policy to be adopted or the expenditure likely to be incurred. From an analysis of the estimates, however, it does not appear that any striking changes or abnormal increases are contemplated in the near future.

The numbers for which estimate has been made in the Budgets for 1927-28 and 1928-29 are as follows :—

	1927-28.	1928-29.	Difference.
Army.			
Officers	6,641	6,795	+ 154
Other ranks	100,900	101,810	+ 910
Cadets, etc.	5,250	5,321	+ 71
Navy.			
Officers	302	341	+ 39
Seamen	3,715	4,482	+ 767
Gendarmerie.			
Officers	91	102	+ 12
Other ranks	5,035	5,225	+ 190
Total increase	—	—	+ 2,143

Increased allotments are included for the Navy (+ 10 millions) and Air Force (+ 3 millions). General Hadjié insisted that these relatively small increases were not in any degree proportionate to the real needs of those two services, and he foreshadowed the inclusion of much larger sums in future budgets.

The officer strength in the Army is rising somewhat rapidly; this fact was adversely commented upon by some members of the Financial Committee, but the Minister was able to prove that numbers were still far short of establishment. He stated that the private soldier costs 7 dinars a day (approximately 6d.), which statement explains to a large extent the divergence between Yugo-Slav estimates and our own.

The continued political dissensions, which have been such a marked feature of the internal situation, have had little effect upon the army. During the recent Cabinet crisis in February, that very irresponsible politician, M. Radié, startled the country with a proposal for the formation of a Coalition Government under the leadership of a non-party man, preferably a soldier. Although this attempt to drag the army into the forefront of the political stage evoked a violent outburst in the Skupstina, it does not appear to have had any real measure of support either in Court circles or in the army itself.

O

The Yugo-Slav Army is undoubtedly the most formidable force which exists to-day on the Balkan Peninsula. It is also the surest guarantee of stability within the country itself. On the other hand it cannot yet be regarded as a match for the armies of any of the first class powers. The chief reason for this is still the question of armament, although real efforts are undoubtedly being made to improve equipment and to organize local resources for the production of munitions. Shortage of trained officers and deficiency of rail communications are contributory reasons of much importance.

FRANCE.

THE NEW SCHEME OF RE-ORGANIZATION.—The following criticisms levelled at the new scheme of re-organization are important, especially if one remembers the short period of colour service and the very high proportion of reservists in the future mobilized French Army :—

(i) 106,000 long service non-commissioned officers are generally acknowledged as insufficient for mobilization needs ; 150,000 are really required.

(ii) By the provisions of the Law of Cadres and Effectives, the French General Staff have definitely adopted an army based on man power and on the fullest use of national reserves, as opposed to a small professional army and intensive mechanization. This apparent disregard of recent developments in mechanization is largely due to the expense involved and the impossibility of equipping a large army at the outset with machines. The new organization is, however, in theory, a distinct improvement, being based on sound and definite principles. At the same time it is intentionally framed so as to give the necessary elasticity for the increase or decrease, by decree, of certain types of units, as, for example, air squadrons, tank battalions and specialist units, and for the adoption of new ideas suited to modern war.

(iii) The effectives available are insufficient for the number of units and formations laid down ; this necessitates a certain number of units in each regiment being maintained in cadre in peace. This will be a source of weakness to the first line troops on mobilization.

(iv) The value on mobilization of reserve officers and non-commissioned officers, who will only have served six months as such in the " active army," is problematical.

(v) In case of mobilization, insufficient stiffening by white men of native troops is provided for.

(vi) The unequal incidence of colour service on whites and natives, being in the proportion of one year to three years, may cause trouble if it is exploited by propagandists.

Nevertheless it is admitted that the scheme as a whole has a sound framework, reduces the period of colour service of the individual, but retains his services in case of national danger for twenty-eight years. It appears that by reversion to twenty years as the age for conscript service in 1935 and for the ensuing four years, the dangerous period due to war losses in 1914-18 may be tided over and the annual contingent kept nearly up to establishment. The *couverture* on the frontier in case of mobilization should be ensured by the active army, expanded by the *disponibilité* classes. Colonial and overseas defence is arranged for on sound lines. The French claim that the organization is not aggressive, and is

based on the democratic principle of the *nation armée*, besides showing a considerable reduction in peace-time formations and effectives. An excellent organization for utilizing all national resources has been arranged and only awaits legislation by the passage of the " Law for the Organization of the Nation in time of War."

PROPOSED TRANS-SAHARAN RAILWAY. — The French Government recently obtained the consent of the Chamber to a law giving authority for the setting up of a commission for the study of the construction of a railway line uniting French North and West Africa.

The political and military value of such a line is admitted. Its economic value, however, is still uncertain. The commission is to study the question of the trans-Saharan railway under the following headings :—

(*a*) *Technical.*—The location of such a railway line, its transportation capacity, method of traction (steam turbines or Diesel engines are mentioned in the preamble), water supply, measures to be taken for the security of the line, etc.

(*b*) *Economic.*—The possibility of the development of the areas served, and a forecast of the traffic.

(*c*) *Administrative and Financial.*—A forecast of the possible financial return of the railway, and recommendations as regards its construction and exploitation.

The preamble to the Bill admits the difficulty of the financial aspect of the construction of the line. It is however suggested that deliveries in kind, obtained under the Dawes Scheme by France, may assist in the solution of the problem. It is also pointed out among the engineering problems, that if the line is to be built from the Algerian end only, it will take considerably longer than if construction can also be pushed forward from the Niger, with a base on some point on the Atlantic coast.

The expenses of the commission are estimated at 11,500,000 francs (about £92,000). This amount is to be provided by the Governments of France, Algeria, French West Africa, Morocco, Tunisia, and by the French railway companies interested in the construction of the line. The expenditure is to be divided between the years 1928 and 1929. It is anticipated that the commission will complete its studies by the end of 1929.

PERSIA.

THE ARMY IN 1927.—During the past year little headway appears to have been made in the regeneration of the Persian Army, promised by Reza Shah's accession to power. Corruption, in all its forms, still persists; training has remained at a very unambitious level, while the enthusiasm that inspired the troops at the time of the coronation of Reza Khan has evaporated. The majority of the higher commanders are men of little ability or character, and, consequently, the military operations of the year (except where tribal levies have contributed some successful fighting) have proved a record of incompetency and minor disasters.

Finances.—The monetary allotment to the army in 1927-28 was, as in former years, 9,400,000 tomans. On the whole, expenditure has been placed under stricter control and the soldiers now receive their pay more regularly than was formerly the case. The War Office has, however, been unable to eradicate various malpractices which continue to cause an embarrassing drain on the funds at its disposal.

Strength.—The estimated strength at the end of 1927 was 38,874, of which not more than 6 per cent. were conscripts.

Composition.—The law of compulsory service was first enforced in the winter of 1926, when it was applied to the provinces of Tehran, Kasvin and Hamadan. This year it was intended to apply the law to all the provinces of Persia, but, owing to strong popular opposition and the agitation engineered by the mullahs, the Government were compelled first to give numerous exemptions, and finally to suspend conscription altogether.

Organization.—In April, 1927, the divisional organization of the Persian Army was abandoned, and the troops in the provinces were organized into small "composite forces" of all arms as these were considered to be more suitable than divisional organization for the rôle to be carried out by the Persian Army. Where two or more "composite forces" are combined under a single command, as in Lurestan and Kurdistan, they are termed a "composite brigade."

At the moment the Persian Army is admitted to be incapable of mobilization for purposes of offence or defence against an external power. Its value is, therefore, negligible. On the other hand, the present organization provides in each military area a self-contained force with a unified command and administration suitable for internal security duties.

AIR NOTES

ROYAL AIR FORCE.

Personnel.

Appointments.—Air Vice-Marshal F. R. Scarlett, C.B., D.S.O., to Headquarters, Air Defence of Great Britain, 15th May, on temporary appointment as Air Officer Commanding-in-Chief, during absence on duty in Australia of Air Marshal Sir J. M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C.; Air Vice-Marshal C. L. Lambe, C.B., C.M.G., D.S.O., to Headquarters Coastal Area, 15th May, as Air Officer Commanding, *vice* Air Vice-Marshal Scarlett; Air Commodore I. M. Bonham-Carter, C.B., O.B.E., to Headquarters, R.A.F., Halton, 1st April, as Air Officer Commanding, *vice* Air Vice-Marshal Lambe; Air Commodore T. C. R. Higgins, C.B., C.M.G., to No. 10 Group Headquarters, 1st June, as Air Officer Commanding, *vice* Air Commodore E. A. D. Masterman, C.B., C.M.G., C.B.E., A.F.C.; Group Captain E. D. M. Robertson, D.F.C., to R.A.F. Depot, 4th May, on transfer to Home Establishment; and Group Captain C. R. S. Bradley, O.B.E., to Special Duty List, 22nd March, on appointment as Air Attaché, Rome, *vice* Wing Commander J. N. Fletcher, A.F.C.

Flying Training.

During the period 1st April to 30th June the following have completed courses of instruction at Flying Training Units :—

Type of Course.	*Officers.*	*Airmen.*
C.F.S. Refresher	16	7
Ab initio	39	13
Conversion	20	—
Refresher	2	1

No. 3 F.T.S. formed at Grantham on 1st May, the first course of eighteen officers commencing instruction on that date.

R.A.F. Practice Camps for Air Firing and Bombing opened on the ranges at North Coates Fitties, Sutton Bridge, and Weston Zoyland, on 1st April.

NAVAL CO-OPERATION.

Fleet Air Arm.

The usual training and exercises have been carried out during the past quarter by the flights embarked in H.M. aircraft carriers.

(*See also* Naval Notes, page 624).

Coastal Reconnaissance Units.

No. 480 Flight, Calshot, have carried out their customary training and exercises with the Atlantic Fleet.

No. 481 Flight, Malta, have carried out their usual co-operation with the Naval and Military units stationed there and continued their normal routine of training and exercises.

OVERSEAS COMMANDS

IRAQ.

Apart from small disturbances in the Hammar Lake district, the situation generally has remained satisfactory during the period under review.

Akhwan Situation.

No further raids by the Akhwan have taken place. Akforce Headquarters was accordingly disbanded on 3rd June, and Ur was evacuated on 8th June. In view of the unsatisfactory state of affairs arising from the recent raids it was decided to arrange a meeting between Ibn Saud and a representative of His Majesty's Government, in order to reach a satisfactory agreement regarding affairs on the frontier. Ibn Saud expressed his agreement to such a meeting and on 2nd May Sir Gilbert Clayton, who had been appointed to represent His Majesty's Government, arrived at Jeddah. Negotiations were accordingly opened at Jeddah on 8th May. Satisfactory progress was made on several of the subsidiary questions under discussion, but the negotiations had to be temporarily suspended to enable Ibn Saud to attend the pilgrimage at Mecca. Sir Gilbert Clayton took this opportunity to return home to report to His Majesty's Government the progress made. The negotiations are to be resumed early in August, and Sir Gilbert Clayton is now on his way back to Jeddah for this purpose.

(*See also* International Situation, page 610).

Hammar Lake District.

During May, disturbances occurred in the Hammar Lake district; Ghadhban al Khaiyun, an outlaw Sheikh of the Bani Asad, who with a following of about seventy men, had been carrying out acts of brigandage, attacked a force of police near Abid, killing one and wounding two others. Ghadhban subsequently took refuge at Gubbah, a remote island in the Hammar Lake. As a result of this attack he was warned on 13th May that unless he submitted unconditionally to the Government, air action would be taken against him without further warning. The warning was ignored and on 16th May air action was accordingly commenced against his temporary quarters near the Hammar police post, by aircraft of No. 84 (B) Squadron, resulting in the flooding of the camp by the bursting of the protective bund by bombs. On the following day, bombing was continued, this time against his permanent headquarters, about seven miles north of Chubaish. Several direct hits on the camp were observed and the outlaws were engaged by the police while endeavouring to make good their escape. Air action was again taken on 22nd May against the village of Gubbah, Ghadhban's stronghold. The village was partially destroyed and was subsequently occupied by the police, who completed the work of destruction. The followers of Ghadhban were dispersed as a result of the action of the aircraft. Ghadbhan himself, who was seriously wounded during the attack by the police of 17th May, is stated to be anxious to surrender and is endeavouring to negotiate terms with the authorities.

Northern Iraq.

Since the occupation of Barzan by the Government forces in June of last year, Sheikh Ahmad has been in a truculent mood and has endeavoured to persuade the villagers to pay taxes through him and to resist Government control. He also threatened to attack if the Levies were not withdrawn from the area and he himself appointed Administrator of Barzan. In consequence an official letter from the High Commissioner was dropped on him by aircraft on 25th January, informing him that if he had any serious complaint he should arrange to meet a representative of the Government in order to settle his grievances. He replied agreeing to the proposal and a meeting between him and the Administrative Inspector of Mosul took place at Billeh—where the Levies are stationed—on 31st March. As a result of the interview, Sheikh Ahmad withdrew his objections to the Levy camp at Billeh, and it was agreed to withdraw the police post at Barzan as soon as accommodation could be completed for them at Billeh.

AVIATION IN FOREIGN COUNTRIES

AFGHANISTAN.

In December, 1927, an air mail between Kabul and Tashkent was started, the Soviet and Afghan Governments being equally responsible for its running and maintenance. At first a fairly regular fortnightly service was maintained, but in February it was discontinued on account of the weather. In April the service was started again but at present it is not being run regularly according to the time-table.

While in Germany, King Amanullah was presented with a three-engined Junkers G.24 monoplane, by the German Government. At the same time the Afghan authorities purchased two single-engined Junkers F.13 monoplanes.

On 13th May last a D.H.9.a., piloted by a Russian, forced landed in Indian territory near Parichinar. It was apparently one which left Termez for Kabul on that day. The aircraft was badly damaged and had to be dismantled and taken to Afghanistan by road.

FRANCE.

General.

A distinguished mission was invited to England to see the Royal Air Force Display on 30th June. The officers, who stayed a week and visited a number of Air Force stations, were :—

Général de Division Hergault.
Vice-Admiral Frochot.
Général de Brigade Pujo.
Colonel de Crozals.
Lieutenant de Vaissean Amet.
Capitaine Fournier.

The mission not only arrived and departed by air, but carried out their tours in England by air.

Military Air Service.

Accidents.—From 1st January to 20th July, 1928, thirty-five deaths resulting from flying accidents, have been reported in the Press.

Long Distance Flights.—Between 7th July and 12th July, Lieut. Lasalle and Adjutant Durayon completed a course of 8,200 miles on a service aircraft, modified only by the addition of extra tankage.

On this aircraft, a Potez XXV, with a 450-h.p. Lorraine engine, the following capitals were visited, the return to Paris being made each day: Oslo, Warsaw, Madrid, Rome and Lisbon. These flights were accomplished without incident on the aircraft the pilot normally flies in his regiment.

Naval Air Service.

Accidents.—From 1st January to 20th July, 1928, nine deaths resulting from flying accidents have been reported in the Press.

Shortage of Personnel.—Difficulty is still apparently being experienced in obtaining sufficient skilled personnel to enable the expansion of the Naval Air Service to proceed according to the programme laid down. It is reported that the strength of units is being reduced in consequence of this.

Polar Rescue Expedition.—Lieut. Guilbaud, one of the most noted of the French naval aviators, has been lost in the Arctic while assisting in the search for the crew of the lost Italian airship. This officer, who had been standing by to attempt an Atlantic crossing in a flying boat, was despatched to the search by the French Government. He set out, accompanied by Amundsen, at the end of June, and no news has been heard of either. He is a great loss to French naval aviation, for he had carried out several very notable long distance flights.

Civil Aviation.

Salon d'Aeronautique.—An International Aeronautical Exhibition was held in the Grand Palais in Paris from the 30th June to 15th July. This exhibition was of moderate interest only, as various eminent French constructors were not participating.

Germany, Italy and Czechoslovakia were prominent exhibitors, while Great Britain was represented. Both the naval and military air services had large exhibits, which might be considered as recruiting propaganda.

Long Distance Flights.—Costes and Le Brix completed, on 14th April, their very fine flight around the world. With the exception of the stage from San Francisco to Tokyo, which was performed by boat, they flew their Breguet XIX with 650-h.p. Hispano engine, all the way.

They covered 35,500 miles in 347 hours of flying time, including one stage of 2,850 miles without a landing. Perhaps the most remarkable part of their flight, however, was the dash from Tokyo to Paris, between the 9th and 14th April, a distance of slightly over 10,000 miles, in 102 hours in the air.

Light Aeroplane Clubs.—An aviation club for juveniles, to be known as the "University Aviation Club" was formed this Spring with headquarters in Paris. This new organization, which is the first in France, will permit its members to obtain their pilot's certificate at very reduced fees.

Another light aeroplane club, the "Alps Light Aeroplane Club," has just been formed at Grenoble.

ITALY.

NEW AIRPORT.—Italy's new civil airport, Littorio, five miles north of Rome on the banks of the river Tiber, combining an aerodrome and seaplane base, was inaugurated on 21st April by Signor Mussolini. This is to be the future port for all Italian international air lines.

On the same day a new seaplane service commenced operation from Rome to Cagliari (Sardinia) and is to run three times weekly in each direction.

MEDITERRANEAN SEAPLANE CRUISE. — An air demonstration, in which sixty seaplanes took part, was recently carried out by the Italians in the Western Mediterranean. The route followed was Orbetello, Elmas (Sardinia), Pollenza (Balearic Islands), Los Alcazares (Southern Spain), Port Alfaques, Barcelona, Berre (near Marseilles), Orbetello, a distance of about 1,750 miles. The seaplanes left Orbetello on the 26th May under the command of the Marquis de Pinedo and returned on the 3rd June, having carried out the cruise successfully. British, American, French and other Air Attachés accompanied the aircraft as passengers.

FLIGHT FROM ROME TO LONDON. — On Thursday, 28th June, twelve Italian aeroplanes started from Rome to fly non-stop to England, ten of them succeeded and arrived at Hornchurch Aerodrome the same evening, the other two came on the next day having made forced landings on the way.

Six of the aeroplanes were of the type Ansaldo A.120 with Fiat 550-h.p. A.22 engines and six were Fiat R.22 type, fitted with similar power units.

All these aircraft were two-seaters and, included among the twenty-four officers who flew in them, were His Excellency Italo Balbo, the Under-Secretary of State for Air in Italy, and his Staff.

The object of the visit was for these officers to witness the Air Force Display at Hendon on 30th June.

SPAIN.

SINGLE CONTROL OF AIR LINES.—The Spanish Government recently offered the monopoly of Spanish domestic and international air lines to the firm organizing a system of air transport centralized under the control of one company. The conditions of the concession require that the concessionary shall have a capital of 5,000,000 pesetas. An annual Government subsidy of 1,500,000 pesetas and a monopoly will be given to the firm making the lowest offer for the transport of merchandise, mail and passengers.

Thus far, only three proposals have been submitted and though the stipulation has been made that the company must be formed exclusively of Spanish capital and technical experts it now appears very probable that it will go to German interests camouflaged under a Spanish corporation.

French and Italian companies have offered to form partnerships with Spanish firms to get the contract.

UNITED STATES.

AIR ACCIDENTS.—In the early part of this year the Bureau of Naval Aeronautics published a report on the causes of air accidents, giving the conclusions arrived at as the result of a year's careful study of the matter. The principal points contained therein were as follows :—

" (1) The type of plane with welded steel fuselage, as used at present, is 75 per cent. safer in a crash than the earlier type where the fuselage was made of wood with wire bracing.

(2) Within certain limits, the number of crashes, injuries and fatalities are indicative of the state of discipline and efficiency of the various units. Further consideration must, of course, be given to the type of duty performed by these units and other affecting elements.

(3) The human and not the mechanical element is most often responsible for crashes. Eighty per cent. of the fatalities occurring during the years covered by the analysis can be traced directly to personnel. This is in general accord with the results of similar analysis known to have been made in other countries.

(4) When the mission of a flight is such as to require the pilot to exercise caution, such as indoctrinal flights where other naval officers, not pilots, are given courses calculated to teach them the problems of aviation rather than the art of piloting, or where sick or injured are being transported, or in other cases where the occupants of the airplane are incapable of looking out for their own safety and the responsibility rests solely upon the pilot, the records show that the pilot can and has risen to the occasion with a record of only a few accidents.

(5) Over two-thirds of the crashes resulting from so-called engine failures are not a fundamental fault of the power plant, but in the final analysis can be traced to faulty operation, maintenance or inspection.

(6) The two leading causes of failure of the human element are bad judgment and inexperience.

(7) The factor that counts most with the efficiency of the individual pilot is experience, and it is believed that therein lies the answer to the problem. Pilots with an average annual flying time of 400 hours have 40 per cent. fewer crashes than those with 100 hours."

Some further aspects of this subject are contained in an article in *The Army and Navy Journal* of Washington, the author of which is described as " an outstanding Army Air Corps authority." The article deals mainly with material factors and the following are extracts :—

" Three basic causes have been found in deaths and accidents in the Army Air Corps : fire, motor failure, and aeroplane failure. The human equation, which must be considered in decreasing accidents, involves the pilot's judgment, physical condition, experience, and ability to combat weather conditions and sudden atmospheric changes.

" Fire during flight may be caused by ignition troubles or through a gasoline line break, consequent escape of fuel and its contact with the hot exhaust pipe or wires, with resulting fire. Fires from this source have been virtually eliminated. Danger of short circuits is avoided by placing a control box with circuit breakers in the cockpit. In case the electrical system goes out of order, there is a master switch which throws off all electrical leads to all parts of the plane except the motor. motor ignition leads may also be cut off by a separate switch. Independent radio, instrument light, landing light, landing flare, and heater apparatus switches are also used in eliminating fire hazard from short circuits.

" Fire may occur in the magneto in planes equipped with magneto ignition. A fireproof ventilating hole cap has been devised which diffuses and cools the flame from the vent hole, thus preventing fire outside of the magneto.

"Gasoline tanks are covered with a heavy rubber fabric envelope of bullet-resisting character, to avoid piercing bullets. This rubber closes up the bullet hole and prevents escape of gasoline. This also conserves the fuel supply, often preventing a forced landing. Most military planes have several types of gas tanks, wing, main, and auxiliary. Some have also a 'belly' tank to permit extended cruising. In case of trouble, the 'belly' tanks may be dropped clear of the plane by a release lever in the cockpit. The entire plane's fuel supply may also be discharged through a main valve when a forced landing is in prospect, to avoid fire if the plane crashes.

"Newer types of planes have Pyrene motor-drenching systems, controlled by a cockpit knob. There is seldom time to use the hand-Pyrene to spray a motor afire, and air blasts make this method useless.

"The danger of forced landings has been lessened by use of brakes on planes, allowing one-half of the former necessary distance for a dead stop. Independent use of right and left brakes facilitates taxying, particularly in strong winds.

"Motor self-starters eliminate danger to personnel in starting motors. The 'electric inertia starter' is used on planes, as automobile-type starters have too much weight and operate at slower speed.

"Navigation in cloud or fog is hard and fatiguing. To fly a true compass course is practically impossible when the ground is not wholly visible and when the old style compass is used. A new compass, which is set on the desired course marked 'zero,' has been developed for bad weather flying. Any deviation from the desired course is at once known to the pilot.

"Airdrome landing field floodlights are now in wide usage as are revolving direction beacons, which guide pilots to safe havens marked by the lights. Radio beacons are meeting with successful introduction, and have proved their worth on the Hegenberger-Maitland and Southern Cross flights. The beacon is of two crossed loop antennas transmitting 'N' and 'A' signals in Morse code. In practice a transmitting goniometer permits shifting of the bisector of the projected angle to any desired direction. The 'N' and 'A' signals combine into a single dash or 'T' signals the bisector of the projected angle which is the line of flight. In flying by radio beacon the pilot so directs his course as to hear the 'T' signal which is received at regular intervals on a standard airplane receiving set. This automatically compensates for errors due to cross winds, which must be corrected by the pilots when navigating by other known methods.

"Failures due to the pilot are becoming more and more rare. Careful training and watch over the individual pilot, and a high physical standard are responsible for the improvement. During the World War, when the Flying Service was developing, the Medical Department established a Corps of Flight Surgeons. They are attached to all flying units, and in addition to duty as doctors, are continually observing pilots under their care. The slightest 'let-down' is noted and corrected. The result of this care, combined with efforts to find perfect plane equipment and safety devices, has been a greater elimination of accidents and flying casualties in the Air Corps."

AIRSHIP NOTES

GREAT BRITAIN.

New Airships.

Progress with the two new airships under construction has been maintained. "R.100" is now nearing completion, whilst, in the case of "R.101," the main portion of the hull structure is now erected, complete with fuel and ballast tanks, piping, etc.

Airship Stations.

Cardington.—The second airship shed, which was recommended by the Imperial Conference (1926), is now erected, but the concrete flooring and certain minor external services have still to be completed.

India.—It is anticipated that the shed at Karachi will be completed in a few weeks' time.

The Indian Government have decided to proceed with the erection of a mooring tower in addition to the shed at Karachi airship base. The tower structure is already fabricated and contractors have been instructed to proceed with the shipment to India and erection on site.

Canada.—The Dominion Government are including an airship mooring tower as part of the new air port which is being established at St. Hubert near Montreal. The tower structure is now in course of erection and the tower-head machinery, which was manufactured in this country, has now been shipped to Canada.

It is hoped to complete the tower by the latter part of the year.

South Africa.—The Union Government have finally selected a suitable site for the first mooring tower near Durban and one of their engineers is discussing details of the equipment and layout with the technical staff of the Air Ministry before orders for the mooring tower structure and machinery are placed on behalf of the South African Government.

ITALY.

Polar Flight.—The airship "Italia" in which General Nobile hoped to explore further the North Polar regions, met with disaster when returning to its base at Spitzbergen from the second flight over the Arctic, on 25th May. From this date until the 9th June there was no news of the airship and all efforts to trace its position met with failure. Search was continued by Swedish, Norwegian and Italian airmen and the base-ship "Citta di Milano," but the work was greatly impeded by the adverse weather conditions prevailing.

On the 9th June, the "Citta di Milano" received wireless messages from the "Italia" stating her position and asking for help. It was discovered that the airship was wrecked on the eastern extremity of North-East Island, Spitzbergen, but that all on board were alive. Later information showed that there were five

companions with General Nobile, three having started to walk across the ice, and seven being carried away east in the wrecked airship. Of the latter party there is no news. Though wireless communication was re-established it was not until the 20th June that General Nobile and members of the expedition were sighted by Major Maddelena, the Italian airman, who though unable to land, dropped supplies to the marooned party. On 23rd June an aeroplane of the Swedish expedition succeeded in landing on the ice near General Nobile's camp and General Nobile was brought to Whale Island. Subsequently, the Russian ice-breaker " Krassin " rescued the remainder of General Nobile's group and two of the walking party, the third having died.

JAPAN.

AIRSHIP LOST.—The small naval airship " F.5 " was wrecked off Yokosuka on the evening of 5th July, and two officers and a warrant officer were drowned. Of the other four members of the crew, two received severe injuries. The mishap occurred during a fog, and was reported to have been due to the pilot misjudging the altitude and driving the vessel into the water.

UNITED STATES.

MOORING MAST TRIALS.—It was reported in the *Army and Navy Journal* of Washington that extensive experiments were to be made this summer at the U.S. Naval Air Station, Lakehurst, N.J., where the naval dirigible " Los Angeles " is based, with the stub mast for mooring large airships.

SMALL AIRSHIP LANDED ON MOVING TRAIN.—The same publication states that the Army " blimp " C.52 was successfully landed on the roof of a 10-feet wide mail car travelling at 35 m.p.h.

REVIEWS OF BOOKS

GENERAL.

National Policy and Naval Strength and Other Essays. By Vice-Admiral Sir H. W. Richmond, K.C.B. (Longmans, Green & Co., London.) 16s.

This is mainly a collection of addresses delivered by the author at the Royal United Service Institution, Universities, and the Royal Institute of International Affairs.

Their trend is to show that in national policy, and in its complementary aspects of naval strategy, history should be our guide. Admiral Richmond demonstrates that the lessons of the past prove that success ensues from following an amphibious or " British " type of warfare and by allotting to the respective fighting Services their proper functions on their own elements.

Particularly interesting is the author's review of the influences of sea-power in the war with Germany and his criticism of that country for failing to make effective use of her fleet to bring relief to her army. We hope that some day this able pen will be deflected from the eighteenth century in order to elaborate further these lessons of the Great War.

Admiral Richmond's views on the importance of history in the education of an officer must always command respect and few will want to differ from him; but experience of the modern student seems to indicate that he desires his history served up in very concise and practical form and that he has little inclination to read a mass of facts, dates and names for their own sake. He wants " principles " enunciated in bold type and expects them to appeal firstly and foremostly because of their sound common-sense and evident applicability to conditions of warfare as they might recur to-day, rather than because they were the dictum of some historical character. If the student wishes to probe deeper, and he ought to do so, he should find further proof that a principle is well founded in apt quotations, ready to hand, of its use or abuse in times past. There would seem great scope for historical instruction on these modern lines.

Admiral Richmond has given us a valuable collection of short dissertations on policy and warfare; the student may, however, feel that he requires further guidance on the influence which air forces must wield in any future struggle, an aspect of strategy which is hardly touched upon in these pages. But the whole book will give the conscientious reader food for much thought.

A Suffolk Coast Garland. By Ernest R. Cooper. Illustrated. (Heath Cranton, Ltd. London.), 6s.

This is quite a pleasant medley of facts and anecdotes which may appeal to the yachtsman, the sailor or anyone who has lived or had any Service business along the coast of Suffolk.

NAVAL.

A History of Lloyd's. By Charles Wright and G. Ernest Fayle. (Macmillan & Co., London.) 25s.

In this book the authors trace the history of Lloyd's, from its start in an ordinary XVIIth century coffee house to its present day position as a public and international Institution in the great new Leadenhall Street building. The story is a romantic and fascinating one which throws a new light upon the commercial, naval and social history of Great Britain, and there are chapters that, apart from their place in the story, are of special interest to naval officers and to students of naval history. Much research in the archives has brought to light fresh material dealing with losses during the wars of the French Revolution and of American Independence: also a great deal of detail as to convoy organization and trade defence during the Napoleonic Wars which are particularly interesting as foreshadowing developments of the Great War. A chapter is devoted to describing how Lloyd's weathered the storm of 1914-18 and the present and future work of the Institution are also dealt with. The book is, in fact, a history of Lloyd's as an Institution, written without masses of statistics and plentifully illustrated. It shows how Lloyd's has touched the life of the nation at many points, in facilitating the growth of commerce, in ensuring the safety of life and property afloat, in encouraging patriotic effort in moments of national peril and in the organization of trade defence. It is a record which cannot fail to interest readers, and more especially naval readers, who have no connection with the complications of underwriting.

The Life and Letters of Admiral Cornwallis. By G. Cornwallis-West. (Holden, London.) 30s.

Admiral Cornwallis was lucky in the possession of an affectionate mother, rich in Whig connections, and determined that her son should obtain advancement. There was more than a touch of the Roman matron about her, and her letters form some of the most pleasing matter in this biography. Not but what there is much else that is interesting—correspondence between Cornwallis and Nelson, and many another notable figure; accounts of various skirmishes and battles at which he was present (although, to his bitter regret, he never commanded at a first class fleet action), and amongst these, notably, two accounts of the battle of the Saints—one spirited and contentious, and in prose; the other in execrable verse that might well have been left unprinted.

It may be the absence of a great victory with which to link his name that has prevented any biography of Cornwallis appearing before, and Major Cornwallis-West's book will fill a gap in the library of the student who recognizes that, at a momentous epoch in our history, Trafalgar was not the only naval occurrence. At the same time, it cannot be said that the author has completely digested his material, or that his own comments are very penetrating. Still, for the most part he has allowed his material to tell its own story, and this it does tolerably well. It is to be hoped he will correct some of the grammar, should a new edition be called for.

MILITARY.

The Future of the British Army. By Major B. C. Dening, M.C., R.E. (H. F. & G. Witherby, London). 10s. 6d.

The British Army has throughout its history passed through periods of reform in which radical changes have affected its future. To-day it is in the midst of another such period, brought about by all that is implied in the term "mechanization."

Much has been written and said upon this subject, but writing and discussion have been chiefly confined to tactics, to machines and generalities. In the work under review the author has boldly and lucidly considered how this problem affects the organization of the British Army and has made definite and detailed suggestions how in the near future mechanization can be accomplished.

The basis of his book is an article that won the Bertrand Stewart Prize Essay in 1924. Reviewing the major wars of the past sixty years he deduces that the armoured fighting vehicle is essential to rapid and decisive results in modern war and that this entails complete mechanization.

He proceeds to set out the peculiar and diverse problems that confront the British Army which has to be prepared to operate under varying conditions. These problems raise obstacles in the way of mechanization and he submits a solution to overcome them, advocating the retention of a proportion of units on a present-day basis and the mechanization of the remainder of the Army.

Here follows the prize essay which gives in some detail the organization of a mechanized division and corps. He shows how this transition can be brought about without trespassing beyond the rigid boundary circumscribed by finance.

The author is to be congratulated for his boldness in tackling such a problem and for the clear manner in which he sets forth his argument. He has not shirked facing definite facts and figures and has commendably avoided the easy and obscure path of generalities.

But with his arguments all will not agree. Immediate, complete and drastic mechanization may be excellent in theory but dangerous, if not disastrous, in practice.

The present policy of evolution rather than revolution, which appears to be the official one, seems a sounder and safer method of progress.

A. & Q., or Military Administration in War. By Lieut.-Colonel W. G. Lindsell, D.S.O., O.B.E., M.C. (Gale & Polden, Ltd., Aldershot.) 8s. 6d.

It is a pity that this volume should carry a title and an exterior appearance which savours of the "cram book." It is far more than that, since it is a most valuable treatise on the higher aspects of military administration in the field. It contains a wealth of first-class information in a convenient form, illustrated by frequent references to the experiences of the Great War. The method of treatment is good, progressing from sea-transport of stores, lay-out of bases, railway distribution and movements and so forth down to the actual fighting front. There is a good chapter on "War Exhaustion." Altogether it is the work of a practical exponent of sound administration.

It can only be regretted that the author writes as though he were convinced that "the next war" in Europe will largely follow the lines of the campaign of 1914-18. We cannot agree with his statement that Woolwich Arsenal was the target of sixty German air-raids (of which only one struck home); this is not quite accurate. Neither may everybody be convinced that the arrangement, arrived at in 1918, whereby the Directorate of Transportation was made subordinate to the Q.M.G., was the best that could be imagined. The author, may be, is a trifle too didactic in a few places. This fact, however, does not detract from the value of the work.

Artillery: To-day and To-morrow. By Colonel H. Rowan-Robinson, C.M.G., D.S.O. (William Clowes & Sons, London.) 5s.

The author discusses the objects for which the British Army is maintained in relation to the problem of mechanization and concludes that the Army must become completely mechanized. He then considers how this will affect the Royal Artillery.

He arrives at two main conclusions. First, that artillery under the new conditions must be commanded by the C.R.A. from the air. Second, that field and medium artillery will disappear, giving place to a light gun on a tank; in fact that the tank is the artillery of the future.

Moltke defined the art of war as the adaptation of the means at hand to the end in view; in other words, that war is a practical matter. Is the suggestion of command of large groups of artillery from the air a feasible proposition? We doubt it. The author himself indirectly dashes cold water on his red-hot plan, for, on page 19, he says "air information in the turmoil of battle is not very reliable and, if acted upon without confirmation, casualties to friendly troops and a waste of ammunition may result."

Nor can we subscribe to the proposition that the Royal Artillery will change skin with the Royal Tank Corps. The whole function of artillery is to hit accurately and powerfully at long ranges. Why should the advent of mechanization change this rôle? Tanks in battle will still require support by artillery fire beyond the capacity of a three-pounder mounted in a vehicle. Further, the rearward services of a mechanized force with its masses of auxiliary vehicles present a fine target for long-range weapons with air observation.

That the armoured fighting vehicle is a potent arm in battle is a fact proved by war experience, but that this arm can obtain decisive victory unaided by the other arms will not be admitted by all readers of this book.

"De l'emploi tactique de l'organisation du terrain et des destructions." By Lieut.-Colonel G. Bailles, French Engineers. (Berger-Levrault, Paris.) 12 francs.

The author of this small book sets out to bring home to the non-technical branches of the French army the importance of studying an official work published in September, 1924, entitled "L'instruction provisoire sur l'organisation du terrain."

Colonel Bailles divides his book into two parts, the first dealing with the organization of ground, and the second with demolitions. The former occupies the greater part of the book, and is subdivided into three sections. In the first

section Napoleon's ideas on the subject are illustrated by a number of well-chosen examples, which make it clear that Napoleon always insisted on the careful organization of ground by defensive works sited in depth. This applied to offensive as well as defensive manœuvres, and the former were not undertaken except from a well-secured base or L. of C.

The second section traces briefly through the next hundred years, the transition of the French doctrine on this subject. Illustrations are given to explain how the Napoleonic doctrine of the offensive, based on adequate security, had been transformed by 1870 into one of security at all costs, leading to the idea of the entrenched camp. It is shown how, after the disasters due to this passive method of conducting war, the pendulum had swung to the other extreme by 1914, by which time the French army was thoroughly imbued with a doctrine of the offensive " à outrance," and how this led to almost equally disastrous results.

The author then proceeds to demonstrate that the existing regulations (which he fears will receive as little study as formerly) are based on the teachings of Napoleon. He makes many interesting and sound remarks on the future importance of co-ordinated defensive measures even during an offensive, mentioning particularly the protection of the flanks or L. of C. of an attacking force against raids by tanks or armoured cars. Stress is laid on the importance of not wasting technical troops, who should be employed only on technical work which the other arms cannot do for themselves.

The latter portion of the book is devoted to a discussion in some detail of what is, rightly, called the demolition " arm." It is shown how demolitions can be used in conjunction with fixed defences as part of the frontier defence of a country. The difficulties—financial, sentimental, and strategical—of a peace-time scheme of demolitions, are clearly brought out, and the inherent timing difficulty of every demolition is argued at length.

It is somewhat surprising that throughout his book Colonel Bailis practically ignores the subject of chemical warfare, and takes no account of the defensive possibilities of persistent gas.

This is a very readable, non-technical, and instructive book, which is worth the attention of all arms of the British Army.

The Events, Strategy and Tactics of the Palestine Campaign with Illustrations of the Principles of War. By A. Kearsey, D.S.O., O.B.E., *p.s.c.* (late Lieutenant-Colonel, General Staff). (Hugh Rees, London.) 3s.

This long title is in distinct contrast to the brevity of a most useful little " guide to success " in promotion examination. The Diary of the Campaign is of the shortest, but the comments are full and to the point. There are two Appendices—one giving a few skeleton maps which, however, are not of great merit. Surely one of the best ways of fixing such a campaign in the mind is to worry it out on a good map! The book, of course, is of no value without the accompanying study of the campaign in the official history or in some similar text-book.

Oude in 1857: Some Memories of the Indian Mutiny. By Colonel John Bonham, C.B. (Williams & Norgate, London.) 5s.

When the conflagration of the Mutiny spread through Oude, whose garrisons totalled some 6,900 Bengal troops, 10,000 irregular troops and only one battery

and one battalion of H.M.'s Forces, Lieutenant Bonham was in temporary command of an irregular battery in Secrora. Unfortunately the late Colonel Bonham has devoted only one chapter out of twelve to his personal experiences. But these are valuable in that they show that units, in whose men their British officers showed a proper interest, were long kept in hand until overwhelemed by the flames. It is evident that Lieutenant Bonham was but ill-supported by the conduct of the Civil Commissioner and the officers of the other irregular units of which the garrison consisted.

REGIMENTAL HISTORIES.

The History of the King's Regiment (Liverpool), 1914-1919. By Everard Wyrall. Vol. I., 1914-1915. (Edward Arnold & Co., London.) 7s. 6d.

This is a good regimental history dealing with the various battalions of The King's Regiment in France from mobilization to the close of 1915. Their record does honour to the citizens of Liverpool. The maps are simple but adequate. There are a few illustrations and indexes; but the story is in no way overloaded.

The History of the Suffolk Regiment, 1914-1927. By Lieutenant-Colonel C. C. R. Murphy. (Hutchinson & Co., London.) 30s.

This volume may be regarded as a continuation of a Regimental History that dealt with the fortunes of the Suffolks down to 1914. The 1st Battalion began the Great War at Mons and at Le Cateau. The 4th was one of the first of the Territorial Battalions to reach the front in November, 1914. The 2nd Battalion was brought back from Khartum. So the regiment went on multiplying its units in France until ten stood in the firing line. It is a good story and well told. There are a few brief appendices, one good index, but there is sad lack of maps; the single one supplied is totally inadequate.

A Brief History of the 3rd Battalion 1st Punjab Regiment. Anon. (Gale & Polden, Aldershot.)

This little volume was first brought out on the 150th anniversary of the raising of the 16th Carnatic Battalion in 1776. It was later known as a Madras Battalion and later as the 76th Punjabis. This unit began the Great War in Egypt, being transferred to Mesopotamia where it became involved in the siege and surrender of Kut. Later in 1919 the battalion served in Waziristan.

AIR.

The War in the Air: Being the story of the part played in the Great War by the Royal Air Force. Vol. II. By H. A. Jones. (Clarendon Press, Oxford.) 17s. 6d.

There can be few things more embarrassing to an author than an excess of facts. Yet Mr. Jones has never allowed his mass of material to obscure his story. The task of selection must have been prodigious for as Mr. Jones avows in his Preface, he was striving to superimpose the air story on a framework of the naval and military operations and to compile a "general narrative of development."

Carefully, and with here and there flashes of real brilliance, he deals with the air operations during two years of war, the winter of 1914-15 to the end of the Somme battles in November, 1916, including the Dardanelles campaign. The naval air operations in Home Waters down to the end of 1916 and from Dunkirk in 1915 and 1916 and the bombing operations from Luxeuil in the latter part of 1916 are also described. This particular period is of special interest to the student of military aeronautics because during it aircraft were asserting their value. Before this they had been hesitating on the brink, but in 1915 their uses began to be appreciated by both sides and the great battle of designers, when our pilots had to be provided quickly with machines which would enable them to cope with the Fokker, brought matters to a head.

It was then that the fundamental fact emerged that " The ability to meet the Army's air requirements would be conditional on the gaining of air superiority by fighting."

The Fokkers, aided by their interrupter gears which enabled their guns to be fired through the field swept by the airscrew, fought their way to a dominant position in May, 1916. " Their method of attack drew inspiration from the hawk," says Mr. Jones. " The Fokker pilot would cruise at great heights over the German lines and await the passing of suitable victims. He would then swoop down from behind, coming when possible out of the sun so that his opponent might have no warning before he was startled by the rattle of a machine-gun . . ."

The Fokker was really the goad that stimulated British designers and air staff officers to exert all their ingenuity. Perhaps the only serious criticism of this book is that it fails to give due notice to the interesting technical developments which led to improved aircraft and aero-engine performance and which were so decisive a factor in the air war from October, 1915, onwards.

The policy which directed our airmen right to the end of the war was founded in 1915 by General Trenchard and Commandant du Peuty of the French air service. " They came to the conclusion that the corps aeroplanes could best be protected by what one might call the strategic offensive, that is, by fighting and subduing the enemy airmen far away from the aeroplanes flying in direct co-operation with the army. The experience of the French air service during the Verdun struggle confirmed the value of the strategic offensive."

" There is in time of war," says Mr. Jones, in another part, and his remark deserves special attention, " a constant pressure exerted from many directions for a dissipation of air power, but that pressure, if yielded to, is fatal. The air war becomes a test of nervous endurance. The nation which keeps a stiff upper lip, and whose air service adheres to its determined offensive will of course, in the end, secure the greatest measure of protection from the air for all its various activities."

The first torpedo-dropping attacks from the air are dealt with, the first rescue from enemy territory by an aeroplane, which was done by Squadron Commander (the titles then in use are adhered to throughout the book) R. Bell Davies, is described, as is the landing of secret service agents in hostile country.

The use of air-spotting for the fleet, from the time of Commander Altham's report urging the formation of a school at the Calshot seaplane base, to the experiments in flying off the deck of the " Campania," which were done by a Sopwith Schneider Cup type seaplane piloted by Flight-Lieutenant W. L. Welsh, are described.

Sir Walter Raleigh's first volume of "The War in the Air," it may be recalled, gave a brief history of military flying from its beginning and took the war history to the end of 1914. In carrying on Sir Walter Raleigh's work, Mr. Jones has had a difficult task. He has accomplished it conscientiously and well. The book's manner suits its matter; it is a fit repository for great deeds; it is right in emphasising the part played by individual effort, for it was individual effort that first demonstrated the value of aircraft in war.

ADDITIONS TO THE LIBRARY

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NAVAL.

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NATIONAL POLICY AND NAVAL STRENGTH. By Vice-Admiral Sir H. W. Richmond, K.C.B. 16s. 8vo. (Longmans, Green & Co., Ltd., London). (Presented by the Publishers.)

H.M.S. "CUMBERLAND," 1695 - 1927. By F. G. B. Wynn. 8vo. (Charles Thurnam & Sons.)

MILITARY.

MILITAR-WORTERBUCH. By K. H. Eitzen. 8vo. Berlin, 1928. (Presented by the Author.)

ON FUTURE WARFARE. By Colonel J. F. C. Fuller, C.B.E., D.S.O. 12s. 6d. 8vo. (Sifton Praed, Ltd., London.) (Presented by the Publishers.)

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